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CANCER OF THE STOMACH.

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Barely half a century ago one would have been astonished to see a surgeon select a subject for a lecture, cancer of the stomach. It would appear that with a disease so frequent (cancer of the stomach represents 35% of all cancers) we were completely helpless and that our therapeutic measures amounted to simple medical palliatives.

It was in 1879, exactly 40 years ago, that a cancer was first removed from the stomach. The operation was performed in Paris, by Péan, on April 19th, 1879. The following year, a Polish surgeon, Rydygier, at Léopol, followed his example. In 1881, Billroth of Vienna, commenced a series of operations which made such operations a routine course of treatment for cancer of the stomach.

Since this time, interventions have multiplied in every country. The technical details of the operation have been precisely laid down and the immediate results considerably improved. Relapses unfortunately, are frequent. The study of the mode of extension of gastric ulcer made in Paris by Cunéo, whose work was confirmed by the School of Mikulicz especially by Bormann, as well as those by MacCarthy and Blackford, and in the clinics of the Mayo brothers, showing its usual method of propagation, has allowed for more complete extirpation and more definite cures, the number of which has been and will be increased, as physicians are better able to diagnose cases, and urge their patients to submit to an operation at an earlier period.

It may be said to-day, that cancer of the stomach is a favorable cancer from the standpoint of operation, and that if the medical attendant desires it, results of its removal will be among the best cancer results from the point of view of definite cure. The unfortunate part is that many practitioners are far from being convinced of the efficacy of the operative treatment, they appear to think that surgery should be considered only to relieve patients when medical means have been proven unable to give the slightest relief of any painful symptoms. As a matter of fact, if we wish to obtain by operative treatment, that which it can give us, intervention must be undertaken as early as possible,—that is to say, not only must the radical treatment be undertaken as soon as the diagnosis has been made, but, again, this diagnosis must be as early as possible; such are the conditions of success.

DIAGNOSIS OF CANCER OF THE STOMACH.

The diagnosis is sometimes easy, and we ought to immediately suspect the existence of a cancer when we find ourselves in the presence of an individual between 45 and 50 years of age who, without any cause, complains of a serious dyspepsia,—especially when we find it is accompanied by loss of flesh, which has not been accompanied by previous gastric trouble. If, however, we thought of cancer only in such cases, we should overlook a great number of neoplasms, for Hayem often has showed us (confirmed by numerous observations) that cancer of the stomach succeeds an ulcer, and that patients with neoplasms come under medical observation after long gastric trouble.

BY WHAT SIGNS CAN WE RECOGNIZE THE BEGINNING OF THE CANCER DEGENERATION?

It is very often difficult to be precise about this matter. More or less complete loss of appetite, disgust for meats and fats often suggest it. If at the same time patients lose weight and strength,—become pale more rapidly than we would expect under diminished digestion, the probabilities of cancer degeneration are increased. These probabilities increase still further if there is vomiting of food imperfectly digested, especially if the vomitus has somewhat the appearance of coffee grounds and the color of *civet de liévre* (hare cooked with red wine, a favorite French dish.)

The laboratory examination will often aid us in diagnosis. The diminution of acid especially of free hydrochloric acid, the presence of acid fermentation (lactic acid and butyric acid), the demonstration by chemical analysis of occult blood should be looked for. We must not always consider the laboratory examination absolute; for relying entirely on these examinations would be to expose ourselves to diagnostic errors. I have seen on many occasions in cancerous ulcers, not only persistence but increase of hydrochloric acid; on

the other hand, I have found the presence of lactic and butyric acids in ulcerous stenosis, entirely independent of any cancerous formation and due simply to fermentation following stasis of fluid stomach contents. We must therefore consider these various chemical examinations as simply of relative importance, not absolute; only having value when corroborated by other symptoms.

Practically, from the surgical standpoint, the diagnosis of cancer of the stomach is fairly easy. It is true that cancers on the left side, apart from those of the cardia, have a special symptomatology, and are somewhat difficult to diagnose for they manifest themselves by few symptoms at the beginning, at which time only a radical operation is possible. Fortunately, they are rare in comparison with those of the pyloric portion and the ulcer growths of the stomach, which comprehend about 80% of all gastric cancers.

These cancers attract more attention because in many cases they manifest themselves by a number of symptoms that one finds when there is an obstruction to the normal evacuation of the gastric contents, whatever may be the cause of this obstacle.

This symptom-complex which we described 20 years ago in collaboration with Soupault, under the name of "pyloric syndrome" consists of the appearance of pains two hours or more after meals, which cease completely after vomiting. Every time we have such cases, we find it necessary to make a methodical examination of the stomach. One of the most important points for a surgeon to know is whether a gastric stasis exists. Certainly we find stomachs that are atonic, sagging and *clapotant* (splash test) in women especially, but those stomachs empty themselves slowly and finally, after 14 hours without food, become completely empty. The recognition of alimentary stasis in the morning before meals, genuine alimentary retention, incomplete, may be compared to incomplete urinary retention and like it, has some connection with an obstacle preventing normal evacuation of the reservoir. This stasis suffices to prove to us that the patient cannot be cured by medicinal treatment. The surgeon should never neglect to look for it, in every gastric affection where there is a question of an operation.

For the test, add to the food usually taken by the patient in the evening some carrots. Carrots are not hard and indigestible like raisins or the skin of prunes and they are easily recognizable in the stomach contents. The patient remains fasting during the night, and should not even take anything to drink. The next morning, we empty the stomach with a tube. In the fluid contents extracted, it is easy to recognize the debris of carrots. The stomach is then washed and completely emptied. We then inject air through a canula with balloon attachment similar to that used for the thermo-cautery. By percussion of the abdomen, we are able to sketch with a dermographic pencil the contour of the distended stomach on the abdominal wall.

When there is a tumor, it should be sketched before insufflation. During insufflation we usually see the tumor displaced to the right and upwards. When the stomach is insufflated, and we have marked out its contour, we find it situated at the junction of the two curves. The diagnosis of a pyloric tumor is written on the surface of the abdomen.

We now oblige our patient to take a test meal of which we relieve him at the end of an hour; a chemical analysis is then made according to the usual methods. For a number of years we have never failed to make a radiographic examination of the stomach although it is evidently not necessary in many cases; it is however, very useful and it allows us to observe tumors which cannot be mapped out by palpation alone.

Our radiographic expert, M. Maingot, proceeds to do this in the following manner:

Six hours before the examination, he administers 100 grams of sulphate of barium in a flour-paste. Normally, the stomach, duodenum and the jejunum should be empty at the time the patient presents himself to the radiologist. Stomachs that are much elongated, falling almost entirely to the symphysis pubis, can contain from ¼ to 1/5 of the opaque meal without the existence of a stenosis. When it exists, a pocket persists larger or smaller above which there is usually a transparent liquid.

At the time of the examination M. Maingot administers another opaque meal of 100 grams of sulphate of barium in 300 grams of tragacanth mucilage which mixes with water only with difficulty. When there is liquid in the stomach, this mixture spreads in large detached masses which go to the bottom of the organ very much more quickly than in the case where the viscus is empty. This method of filling up is characteristic and allows one to affirm the existence of residual liquid, even when the latter cannot be distinguished on account of the absence of a pocket of air.

When there is no gastric dilatation, the 400 grams of this opaque meal suffice to fill three-quarters of the stomach. If the organ is dilated,

it fills a lesser space. It is then usual to see the organ change shape and to enlarge transversely. At the same time in case of cancer, one sees lacunar images (of spaces) which must be examined from the front and from the side. Seen from the front and from the side, the radioscopic examination allows us to recognize the contractions which are not contained through the spaces (lacunæ). Here we have the means of making a differential diagnosis of importance between the spasmodic deformation which might simulate the lacunæ. The lacunar images of cancer represent the space which the opaque substances cannot enter at the level of the tumor, which projects into the cavity of the organ. Therefore, one understands that the pressure on the lacunar zone increases the latter. This is a method of exploration which can be applied in doubtful cases.

The radiograph plate allows us to retain an image of these lacunes of which the form and site vary according to the case. But from what I have already stated, the radiographic plate is far from giving the information which one obtains by fluroscopic examination, inasmuch as by the latter method, one can determine the mobility of the tumor, its sensibility to pressure and the displacement of neighboring organs.

SURGICAL ANATOMICAL PATHOLOGY OF CANCERS OF THE STOMACH.

It is of great importance for the surgeon to recognize the lymphatic glandular propagation and the mode of extension of cancer on the gastric walls, in order to act as we would in other regions and follow the usual rule, which is to remove in one block all the tumor tissue and the invaded glandular territory. In this connection, the work undertaken at my instigation by my pupil Cunéo, whose studies have been confirmed everywhere, is of the greatest interest, since it shows in what way we should direct our exploration once the abdomen is open, and indicates in a precise manner, rules which should be followed in the course of its extirpation.

(1) Lymphatic propagation: Apart from the region of the fundus wherefrom the lymphatics run towards the spleen of the cardia, other regions of the stomach, and particularly the pyloric region, have lymphatics which converge towards the lesser curvature (figure 1); those of the great curvature ascending behind the pylorus. The glands most frequently removed in cancers of the pylorus or the antrum are those of the lesser curvatures (91.4%) which is explained by the fact that the tributary lymphatic collectors of these lymphatic ganglia represent the principal lymphatic channels of the stomach. The subpyloric lymphatic ganglia are invaded only in 62.5% of cases. In the coronary chain of the stomach, the ganglia placed on the descending or right of the coronary branches are almost always involved; they are, as a matter of fact, the direct terminals of the lymphatics of the pylorus. These ganglia are rather far from the pylorus and in the neighborhood of the point where the trunk of the coronary borders on the stomach. The sub-pyloric ganglia are placed beneath the pylorus in the thickness of the gastro-colic ligaments; they are at some distance from the greater curvature and adhere sometimes to the tranverse mesocolon. The retro-pyloric

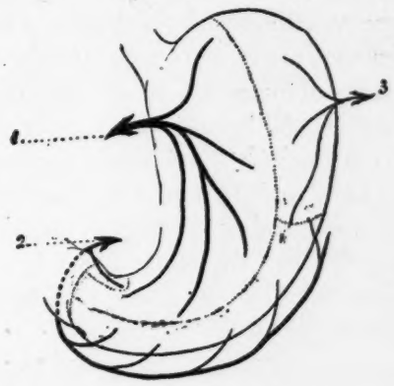

Fig. 1—Lymphatic Locations of the Stomach.

ganglia are placed between the pylorus and the anterior surface of the pancreas, receiving the efferent vessels directly from the posterior surface of the pylorus; they are invaded early.

(2) Propagation within the gastric walls: The development takes place at the expense of the mucous membrane, the cancer rapidly reaches the sub-mucous membrane which may contain white rounded nodules, and which may be more considerable than in the mucous membrane, (figure 2), which indicates the necessity of incising the stomach walls several centimetres from the apparent limit of the cancer (at least 3 centimeters). The muscular and serous coats are invaded in turn, so that the surface of the stomach appears covered with pearl-like white edges, sometimes smooth,—sometimes slightly raised on the surface.

An important point for the surgeon's consideration is the mode of extension of the neoplasm in its breadth. In this connection, we must remember the frequency of the invasion of the smaller curvature, which is in relation with the general law by which epitheliomata fuse towards the lymphatic hilum of the invaded organ, (figure 3). Most of the incomplete removals are so by reason of insuf-

ficient excision of this smaller curvature; it is necessary to make the section near the cardia, above the point where the lymphatics leave the small curvature to pass into the thickness of the lesser omentum. On the contrary, the invasion is less marked on the side of the duodenum, where it rarely extends 2 centimeters; there is therefore, but little risk in making an incomplete amputation on this side.

CONTRA-INDICATIONS TO SURGICAL INTERVENTION.

We know how to make the diagnosis of cancer of the pylorus. We understand its mode of extension and its lymphatic propagation; but before we decide upon an operation, we should determine whether or not there exist any contra-indications. The extreme weakness of the patient may embarrass the surgeon. If, however, this weakness is due to a state of inanition from want of sufficient alimentation depending on a very rigid stenosis of the pylorus,—one may operate in two stages. The first operation should be under local anesthesia, and consists in performing a gastro-enterostomy. In 10 or 15 days, when the patient has regained some strength, resection is made. We have by this method, obtained some successes.

The usual contra-indications come from the recognition of the general conditions, such as the presence of ascitic fluid in the abdomen, an abnormal enlargement of the liver, enlarged supraclavicular or inguinal glands, a neoplastic induration of the umbilicus, the existence of solid tumors of the ovary. In their absence, unless the patient is absolutely cachetic, it is permissible to open the abdomen and to determine by direct examination, whether the tumor can or cannot be extirpated. Unfortunately in a number of cases, we find extirpation impossible, but even here we may often establish a gastro-intestinal opening or gastro-enterostomy, which if it does not cure the patient will correct the accidents connected with gastric stasis, preventing the vomiting, diminishing pain and procuring a certain amount of comfort which will allow the unfortunate victim of cancer to pass away slowly and more comfortably as the weakness becomes progressive.

Sometimes even the improvement is such that for months, patients may think themselves cured, and hope for prolonged life. In general, the usual term of life is about six months and a half.

TECHNIC OF THE OPERATION.

After having cut through the smaller omentum in the part which is only moderately vascular, and opened the greater omentum sufficiently near to the stomach so as not to injure the mesocolon, and to be sure, by direct exploration, of the possibility of an extirpation, the surgeon may undertake the resection. Lifting up the liver, the stomach is drawn down, the falx of the coronary is ligated and severed, drawing down the lymphatic ganglia which are found at this level. The rubber-covered clamps having been placed on the stomach as near as possible to the cardia, the surgeon cuts this viscus between the clamps, throwing it to the right, thus removing almost the whole of the smaller curvature. A thrust made with a sound into the duodeno-pancreatic furrow, bares the gastro-duodenal artery (Figure 4) which can be ligated all the more easily, because it is isolated—the vein

Fig. 2—Stomach opened showing on the anterior surface near the great curvature. The cancerous ulceration extends along the lesser curvature. In the cellular tissue, under the mucous membrane a cancerous mass can be seen at some distance from the ulceration.

leaves the artery to run along the lower border of the pancreas, joining the superior mesenteric vein. There remain now, to complete the resection, but to separate the pylorus from the great omentum and to divide the duodenum. It is necessary to divide the great omentum at a certain distance from the stomach, in order to remove with the tumor the sub-pyloric ganglia which unlike those of the lesser curvature are not in immediate contact with the stomach.

We must remember these ganglia may adhere

to the tranverse mesocolon, and that it is necessary to proceed with great care, because it is at this level that we find the great anastomotic vascular arcade of the mesocolon. With the pylorus, the retro-pyloric ganglia can be removed since they can be easily separated from the pancreas, and without bleeding, thanks to the preliminary ligature of the gastro-duodenal ligature. The operation is terminated by one of the gastro-intestinal anastomoses, either by a gastro-duodenal implantation or by a gastro-enterostomy.

We prefer these methods of anastomosis to the end to end operation recommended by Billroth, for in view of the difference in caliber between the duodenal section and the gastric section, the surgeon is obliged to make a Y suture.

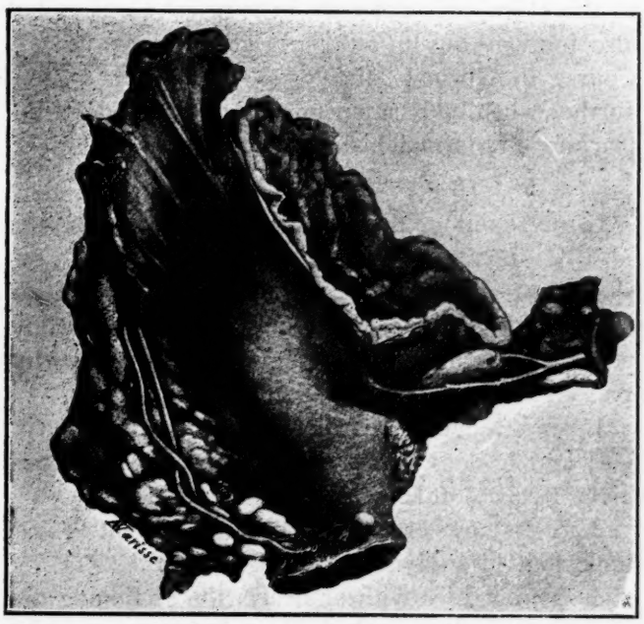

Fig. 3—Excised portion of the stomach seen from its posterior surface. Note the engorged lymphatic glands extending far from the pylorus.

The technic which I have described, appears to be that which has given the greatest number of definite cures. We should not, however, think that less complete operations have no advantage. Wm. Mayo advises excision of gastric cancers, even when the ganglionary masses cannot be removed. It is certain that the improvement obtained by such operations are much superior to results obtained from a simple gastro-enterostomy. In such cases, we can follow the technic of Temoin. He makes no preliminary ligations of vessels, relying on the fact that the arterial trunks (gastro-epiploic, coronary, pyloric) are not attached to the stomach, but send smaller vessels through it which run through the serous and muscular coats, then pass through to branch out in the cellular tissue, he therefore contents himself with drawing the stomach out of the abdomen, rubbing with a compress the anterior and posterior walls in order to isolate these vessels. These small ramifications tear without any resistance, and the slight flow of blood which results is stopped almost immediately. This maneuver repeated over the vessels of the larger and lesser curvatures allows us to detach the great vessels as far off as is necessary to do the excision. Although the operation of Temoin is an incomplete operation and leaves

Fig. 4—The excised stomach is thrown over to the right. At the bottom of the pancreatic-duodenal furrow the gastro-duodenal artery can be seen, which can be ligated, thus allowing its removal later and the prevention of hemorrhage from the ganglia situated lower down.

in place the glands, results have been fairly good. Simple gastro-enterostomy, while an excellent palliative, appears to be destined to more and more restricted application, in all cases where the stomach can be mobilized, where consequently, excision is technically possible, it being justifiable in spite of its being an incomplete operation, since it sometimes preserves life where survival was despaired of.

ULTIMATE RESULT OF THE OPERATION.

In conclusion, I shall mention a few statistics relating to the ablation of gastric cancers. Lerichie in his thesis of 1906, had collected 88 observations of patients who had survived more than five years; in some cases even 15 years. Since then the num-

ber cured has multiplied. Although Temoin's operation leaves the lymphatic ganglia in place, 169 patients survived the operation and nineteen for five years; eight over six years; five over seven years; four over nine years; one over ten years, one over twelve and one over thirteen years.

W. Mayo with 239 operations; during five years found that 62 survived for five years; eighteen over eight years, seven for ten years, five over eleven years, two over twelve years.

I have lost sight of a great number of my own cases, but have been able to follow three living after three years; three after six years; two after seven years, and one after thirteen years.

It is therefore permissible to say that the surgical cure of cancer of the stomach is possible. The situation would be improved still further if physicians whose collaboration is so necessary, would endeavor to diagnose cancer of the stomach early and immediately reommend their patients to have recourse to surgical intervention.

THE PRACTICAL TISSUE EXAMINATION. HERESIES AND FACTS.

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Asked to roughly classify tissue examinations, I would suggest the following scheme: 1. Surgical excisions. 2. Autopsy material.

This paper is concerned with the first class of work only; and it may be ventured first of all, that the methods applicable to surgical excisions are entirely different from those used in working up post-mortem material.

Those methods best applicable to surgical pathology, are the rapid methods, although in some cases where haste is not imperative, the slower methods may be used. However, they are usually unsatisfactory because both the surgeon and the patient wish to know the finding as soon as possible.

RELIABILITY OF THE FREEZING METHODS.

Many men (and especially those interested chiefly in research or autopsy work) are inclined to the opinion that the freezing methods are less reliable than the celloidin and paraffin methods; but this idea is erroneous, providing of course proper technic is used with the freezing. The sections are somewhat thicker, but in the proving of cancer, the pathologist is quite as much interested in cell relations as in cell types, and while sections can be too thick, it is just as well for them not to be too thin. Then it is absolutely true that the man who has relied mainly upon the celloidin and paraffin methods, will attempt with the freezing methods, those same fixations and stains to which he has become accustomed. He will promptly fail to get results because the after-technic applicable to the freezing methods is entirely different from that used in autopsy work.

Quite a few authorities are now agreed that by proper fixing and staining methods, frozen sections may often be more perfect, more valuable and more beautiful than those secured by paraffin or celloidin infiltration. The reader may be somewhat surprised in the statement which is to follow and which has no particular relation to the subject: the writer of this paper has determined to his satisfaction that proper freezing methods are superior to the older ones not only in surgical biopsies but also for working up autopsy material. Krause (A Course in Normal Histology) goes even a step further when he recommends frozen methods in the teaching of normal histology.

THE PRESERVATIVE PROBLEM.

In my opinion, the best preservative for tissues is 10% formalin. Other preservatives act too slowly, precipitate pigment into the tissues or fail to penetrate to the center of the lesion. Alcohol penetrates well but falls short for the following reasons:—

1. Its strength, as ordinarily obtained, is variable; and it does not produce the constant picture given by 10% formalin.

2. It destroys erythrocytes and this point is very important in studying surgical material.

3. It interferes with or delays the sectioning and must often be washed out before attempting microtomy.

THE VALUE OF EXPERIENCE.

The surgical pathologist must be a medical graduate. A thorough medical education is essential, and the man who has finished only his laboratory courses is not a safe worker. He must also have completed his work in the clinical subjects, should be especially well read in surgical diagnosis and, if possible, should have done some post-graduate work in these branches. Added to this should be many years' rich experience with tissues, not in autopsy work alone, but in surgical pathology. The worker should be a cellular pathologist as well as a tissue pathologist. He must understand not only cell relationship but also cell morphology, the normal and pathological limits. In a sense, he should be a research worker and should be qualified to follow up certain practical questions in technic.

A few men have the idea that a nurse or pharmacist may attend a six weeks' course in tissue pathology and then make reliable or even clever surgical pathological diagnoses. A few others apparently believe that such laymen may be able to handle the "easier" tissues. I have never seen this succeed, for the mere reason that the surgeon does not usually know whether a tissue examination will prove easy or difficult. It would not be safe to trust a physician who could diagnosticate only typhoid fever.

He who attempts to reach the goal by reference text-book pictures or contrast and comparison mounts secured in a college laboratory from autopsy materials and especially for teaching, will get nowhere for the simple reason that no two pathological tissues were ever exactly alike. For example, tuberculous disease may present all sorts of pictures, and tuberculous disease cannot be diagnosticated by memorizing pictures, but rather by a knowledge of the various principles involved in tubercle bacillus invasion. I have known many pathologists, and intimately known some very good ones; and I believe that no conscientious one of these will deny that now and then he runs upon a hard problem. Certainly it is not an easy specialty.

GAMBLING WITH THE PATHOLOGIST.

Some heresies are old and strongly founded, but exceedingly difficult (for the pathologist) to explain. Any system which aims at an academic testing of the pathologist (especially by one not a close student of pathology) is a very bad system indeed inasmuch as in the gamble, the patient is the loser. The joke may be on the pathologist but not on the undertaker. The surgeon who withholds information concerning the site of the lesion and vital clinical data, may be ignorant of the fact that the science of pathology does not assume to diagnosticate and prognosticate by tissue structure alone; and the following examples, few of many, will show the whys. Colloid vesicles in the thyroid may be regarded as normal but the same tissue in a bone is very likely malignant. A spinous cell carcinoma of the tongue or lip is quickly fatal but on the forehead or finger, it may grow for years and the patient may succumb to some unrelated disease before the carcinoma has given him much trouble. A columnar-cell carcinoma of the large intestine rapidly gives birth to secondaries, but the same growth in the appendix is often entirely cured by appendicectomy. There are other instances, and the surgeon must never fail to state the site of the lesion and its clinical history. Contrary to opinion, these data will not mislead a competent tissue pathologist. In fact, there is always a tendency to challenge the clinical opinion where any opportunity exists, for that would be a feather in the cap of the pathologist.

PORTION OF LESION FOR EXAMINATION.

In a communication in this *Journal,* I considered this question in detail and so will touch only upon the chief points. The surgeon often goes wrong in selecting the portion of excised tissue for examination. A necrotic center, slough or scab is usually quite structureless. Even though cells may be present, it must be remembered that the pathologist is interested also in cell relations. The specimen should include the line of transition between normal and diseased tissue. Thus only may invasive neoplasia be demonstrated. The cut should be perpendicular rather than parallel to the base that a portion of the latter may be included.

CLINICAL VS. PATHOLOGICAL DIAGNOSIS.

My heading is wrong: there should be no difference. Some surgeons place their trust entirely upon the laboratory diagnosis; others ignore the laboratory report and depend upon the clinical manifestations for their final judgment. If they apparently disagree the cause of the disparity should be investigated. If the surgeon is certain of his ground, he should ask the pathologist to re-examine the material or else seek the opinion of other pathologists. In this way, much concerning surgical pathology will be learned. In 90% of all cases, the diagnoses will agree. If they do not, the pathologist has not been supplied with the proper material or instructions or he is in error; and I am free to confess that a pathologist errs now and then, and I will include others beside myself,—those who are too timid to acknowledge the disagreeable truth. Insufficient training or experience may be the reason, and the surgeon is at fault in the selection of his consultant. Usually, however, carelessness or haste is the true cause. Merely glancing at specimens will eventually wreck a pathological reputation: tissue examinations are truly tissue studies.

VALUE OF THE SURGICAL TISSUE STUDY.

Surgeon Simpson does not believe in tissue work. Surgeon Sampson thinks otherwise and sees that it is done whenever possible. The real value of the work lies not alone in case records or avoiding future legal difficulties. One great value of the work is in the disposal of the "return case." The nature of the pathological process known exactly, not only may the surgical specialist venture an in-

telligent prognosis, but in case the patient suffers recurrence of the trouble, his diagnosis is ready and he can promptly apply rational treatment according to accepted surgical teaching. The surgeon who demands the tissue examination, demands and secures not only the confidence of the patient but especially that of the physician who refers the case to him.

But the chief value of the surgical tissue examination, lies in the perfection of the surgical diagnostician. The surgeon who is satisfied only with his opinion based upon clinical symptoms or the gross appearance of the lesion, learns nothing and profits not at all so far as his future diagnostic problems are concerned. But the surgeon who sees the game through, case after case, is he who will become the clever diagnostician. If a surgeon is a handy operator but a poor diagnostician, I think that we will agree upon how much harm and good he will accomplish.

I have seen it again and again.

NORTH CENTRAL AVE.

INJURIES TO THE WRIST AND TO THE ANKLE.

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Injuries to the wrist and to the ankle constitute a large proportion of those seen in industrial surgery. Few, if any, require more accurate diagnosis and treatment since the least mistake is likely to result in marked impairment of function. The present paper does not contemplate a report of all the different types of injury but merely a review of some half-dozen different cases illustrative of methods of treatment which, in the hands of the author, have given satisfactory results.

Probably the most frequent injury at the wrist is Colles' fracture. The diagnosis in these cases is so simple as to require little explanation. In the treatment, however, numerous mistakes are common. Those that I have seen most frequently are (1) incomplete reduction of the fragment; (2) immobilization of the fingers; (3) unnecessarily complicated after-treatment. It will be well to consider each one of these separately since in so doing, we shall be dealing (1) with the reduction of the deformity; (2) the retention of the fragments in their normal position with the least degree of immobilization of the neighboring joints; (3) the after-treatment.

In reducing Colles' fracture, the "hand-shaking grip" usually taught in the text-books and in the medical schools is not nearly as effective as the direct application of force to the dislocated fragment. The method of Sir Robert Jones consists in grasping the injured hand as shown in figure 1. The base of the surgeon's thumb is brought to bear against the dorsum of the patient's wrist; the base of the opposite thumb gives resistance on the anterior aspect of the radius. The two hands are forced towards one another with a powerful motion of the shoulders. This grip is particularly effective since it enables the operator to apply all his strength accurately and without danger of undue traumatism. Unreduced cases of several weeks' standing can usually be reduced by this method. In case the surgeon's strength is not sufficient in these old cases, the same principle can be

Fig. 1—Photograph illustrating the Sir Robert Jones' method of grasping the wrist in correcting the deformity of a Colles' fracture.

utilized by employing a Thomas wrench, one claw of the wrench acting as the posterior, the other as the anterior lever. Figure 2 illustrates a typical case of Colles' fracture before and after reduction by this method of Sir Robert Jones.

To retain the fragments in the normal position two splints, not extending beyond the fractured bones, are required. The posterior splint has a pad attached to it which presses the dorsal fragment anteriorly, the anterior splint has a similar pad which forces the shaft of the radius posteriorly. These splints can be made of plaster of Paris, but it is simpler to have rounded metal splints of various sizes on hand. These can be used for a great number of cases, are exceedingly cheap, and hold the fragments in accurate apposition. The anterior and posterior splints are held together by several bands of adhesive plaster. No immobilization whatever of the fingers is required.

These short splints render the after-treatment of Colles' fracture simplicity itself. There is no need

of massage or of systematic exercises other than those which the patient would naturally tend to take. The splints are left in position three weeks. Then the posterior one is removed and a few days later the anterior one also. The patient is instructed to move his fingers during the entire course of the immobilization and consequently there is no stiffness to be overcome by wearisome massage treatment. The patient should be able to resume work three or four weeks after the injury.

Fig. 2a—Antero-posterior view of Colles' fracture before reduction.

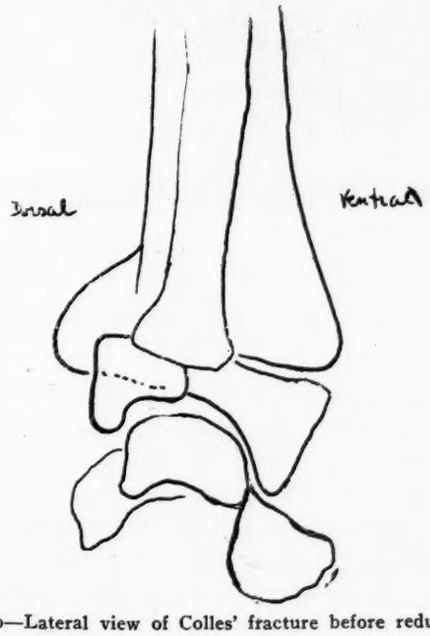

Fig. 2b—Lateral view of Colles' fracture before reduction.

The type of deformity which might be confused with a Colles' fracture is a dorsal dislocation of the wrist. This type of injury I have seen on several occasions, associated usually with the fracture of one or more carpal bones. Figure 3 illustrates a case in point. The patient, thrown violently forward on the outstretched palm while descending in an elevator, fractured the scaphoid and the styloid process of the radius, and dislocated the distal row of carpal bones backward. When first seen there was distinct deformity on the dorsum of the wrist, somewhat lower than that seen in a Colles' fracture. There was marked tenderness over the frac-

Fig. 2c—Antero-posterior view of Colles' fracture after reduction.

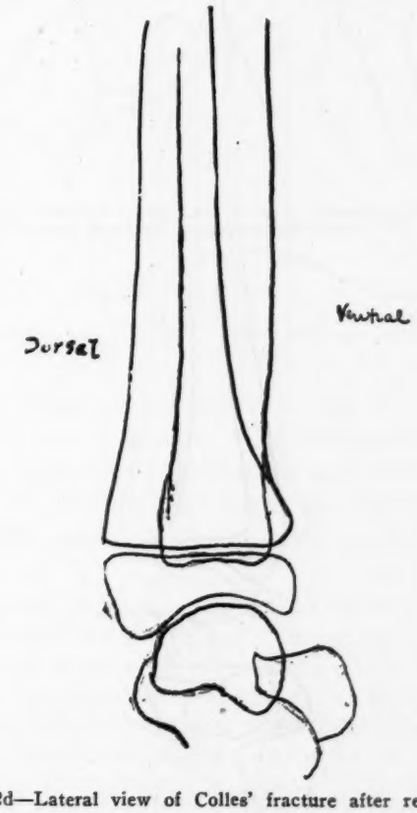

Fig. 2d—Lateral view of Colles' fracture after reduction.

tured scaphoid and radius. Since the fragments of the scaphoid were displaced and there was marked interference with motion, not only of the wrist but also of those tendons which glide over the radial aspect of the hand, immediate operation was decided upon. The fragments of the scaphoid were removed through a two-inch incision running between the long extensor of the thumb and the two shorter extensors. The dorsal dislocation was reduced with an audible snap. A plaster of Paris dressing similar in type to that used in Colles' fracture was applied. Two weeks later this was removed for one hour daily to allow the patient to exercise. Within three weeks he was able to play the piano and to resume his work.

Not all injuries to the scaphoid require operation. The operation is indicated by a displacement of the fragments which interferes with the function of the wrist or of the tendons of the fingers.

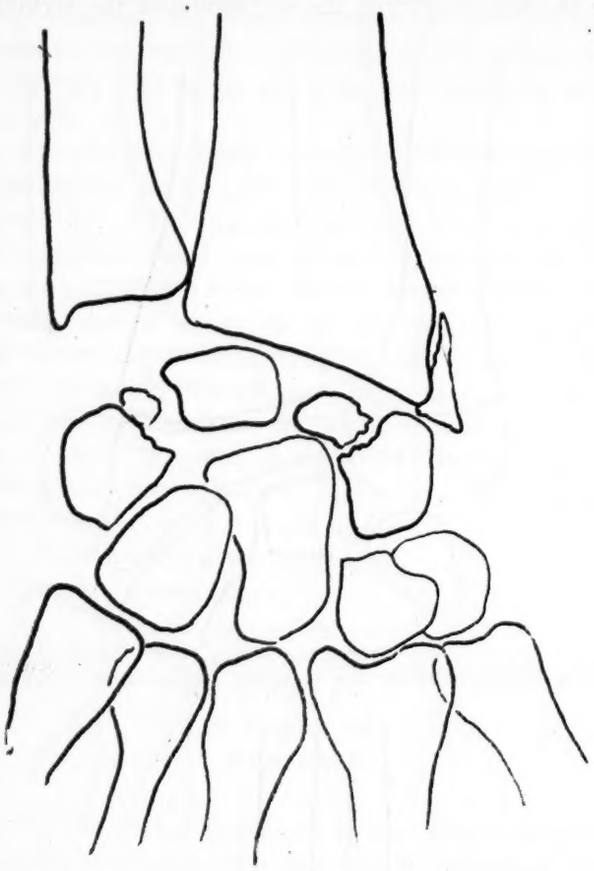

Fig. 3a—Antero-posterior view of fracture of scaphoid and radius combined with dorsal dislocation of the distal carpal bones.

Fig. 3b—Lateral view of fracture of scaphoid and radius combined with dorsal dislocation of the distal carpal bones.

Fig. 4—Skiagram illustrating radial dislocation of wrist complicated with fracture of shaft of radius.

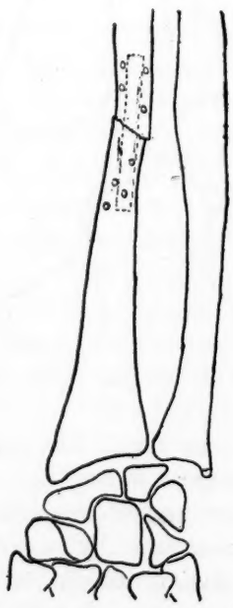

Fig. 5—Same as Fig. 4, subsequent to bone graft and reduction.

Radial dislocation of the hand I have seen in one instance, associated with the fracture of the middle of the shaft of the radius. The styloid process of the ulna presented as a prominent bone, the hand was displaced one-half inch towards the radial side, and there was considerable bowing of the forearm. (See figure 4). The exact mechanism of the accident cannot be stated since the patient remembers nothing other than trying to grasp the reins of a runaway horse. It seems probable that he succeeded in grasping them and that the jerk of the animal gave the hand a marked twist towards the radial side. The patient was referred to me after several attempts had been made by a competent physician to reduce the radial fragments. As none of these had been successful, I operated, fastening the two ends of the radius in alignment by means of a sliding autogenous bone graft. (Albee method). It was then an easy matter by direct pressure over the radial aspect of the wrist to slip it back into the normal position where it stayed of itself. (See figure 5). The functional result in this case has been exceedingly satisfactory: there was bony union in four weeks and the patient returned to work in five.

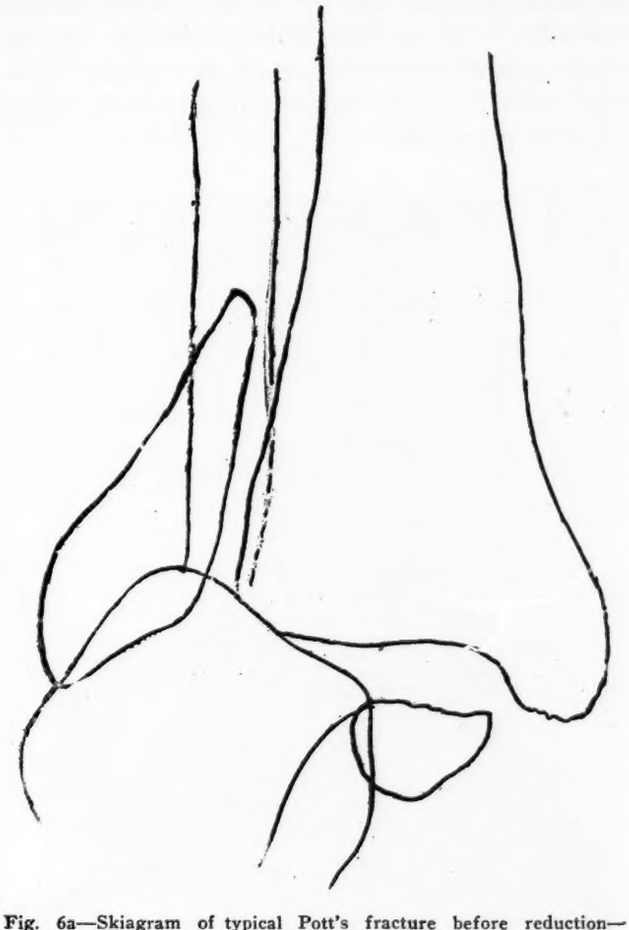

Fig. 6a—Skiagram of typical Pott's fracture before reduction—Antero-posterior view.

As a contrast to these cases of fracture and dislocation are the numerous instances of sprain. Because these do not give röntgenological evidence, their treatment is frequently slighted, though they are liable to cause fully as much functional disturbance as bony lesions. No injuries require more accurate anatomical knowledge than these for their correct diagnosis. The essentials in determining the lesions are palpation and functional tests of all the tendons that might possibly be injured. A specific case will illustrate the method which I employ.

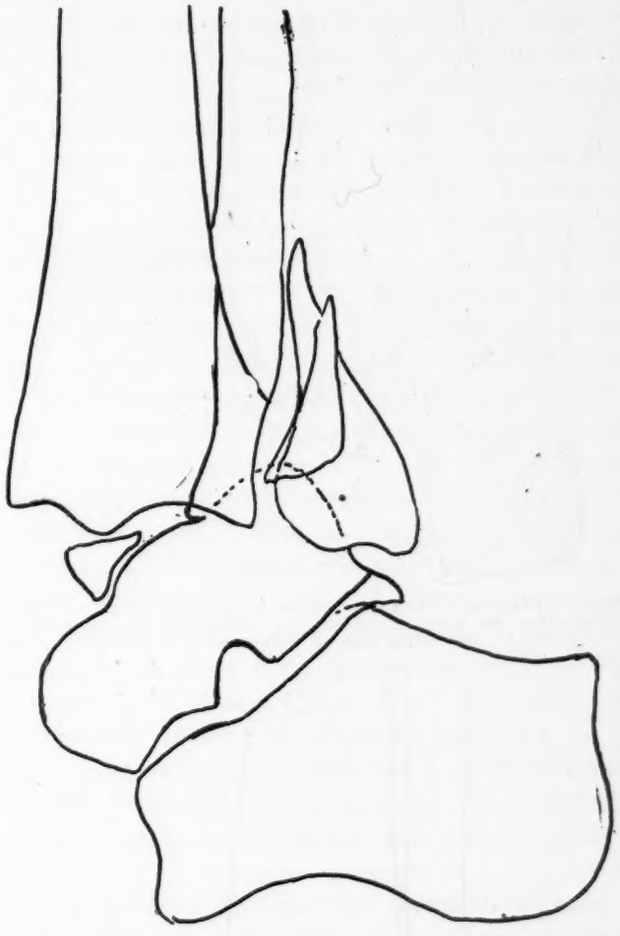

Fig. 6b—Skiagram of typical Pott's fracture before reduction—Lateral view.

Mrs. W. was referred to me with a diagnosis of arthritis of four months' standing. She complained, it is true, of pain in the wrist, but it was evident at a glance that the wrist itself was not involved since there was no tenderness over the ulnar, dorsal, or anterior aspects of the wrist, but only over the radial side. Palpation of the extensor carpi radialis longior and brevior, failed to elicit tenderness, nor was there any over the short extensors of the thumb. When, however, the palpating finger ran along the course of the extensor longus pollicis the patient complained of severe pain. The diagnosis of sprain of this tendon was clinched by asking the patient to

flex the thumb strongly, thus putting the tendon on the stretch. This gave pain and the same motion passively performed had the same effect. Active extension of the thumb against resistance also caused discomfort.

The general principles underlying the treatment of sprains are (1) immobilization of the part in such a position as to afford a chance for healing with retention of the normal length of the injured structure; (2) application of moderate pressure to the injured structure so as to prevent formation of exudate, or in older cases to aid in its absorption.

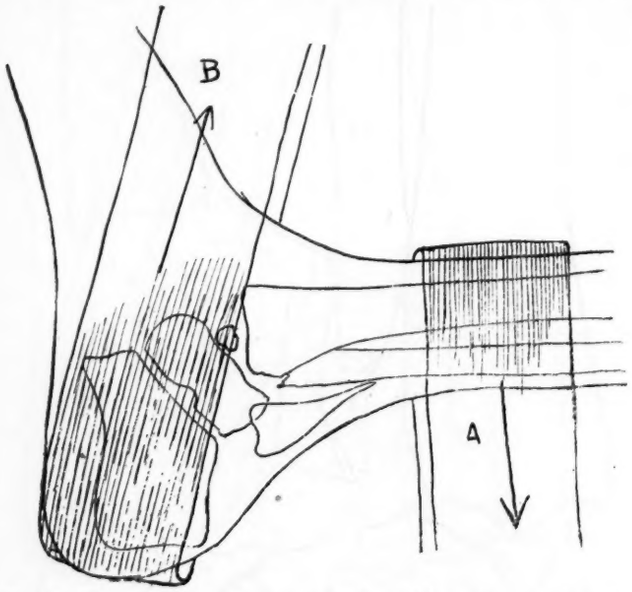

Fig. 7—Diagram illustrating method of applying slings to foot in dressing for Pott's fracture. (a)—Sling held by operator's foot. (b)—Sling passing over operator's shoulder.

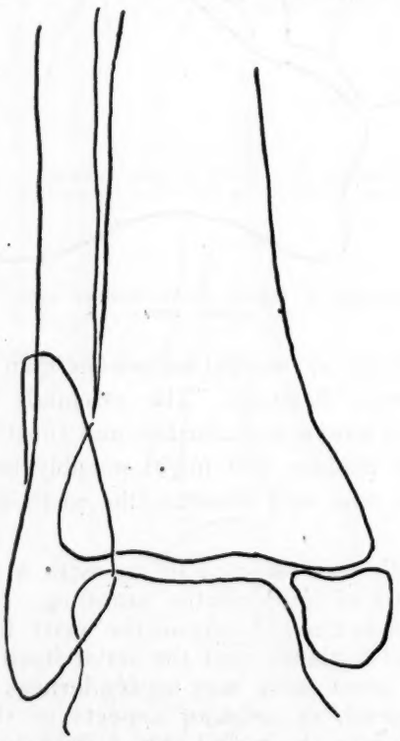

Fig. 8a—Same as Fig. 6 after reduction. Antero-posterior view.

For the particular injury just described, the thumb was held in much the same position one assumes for grasping a pen or pencil. Firm adhesive plaster strapping was applied from two inches above the wrist to the tip of the thumb and in addition a light mold of plaster of Paris served to retain the finger in this restful position. Within a week the pain had subsided and the tenderness had become much less. In two weeks the tenderness had entirely disappeared. Several weeks longer, however, were required before function of the finger could be permitted.

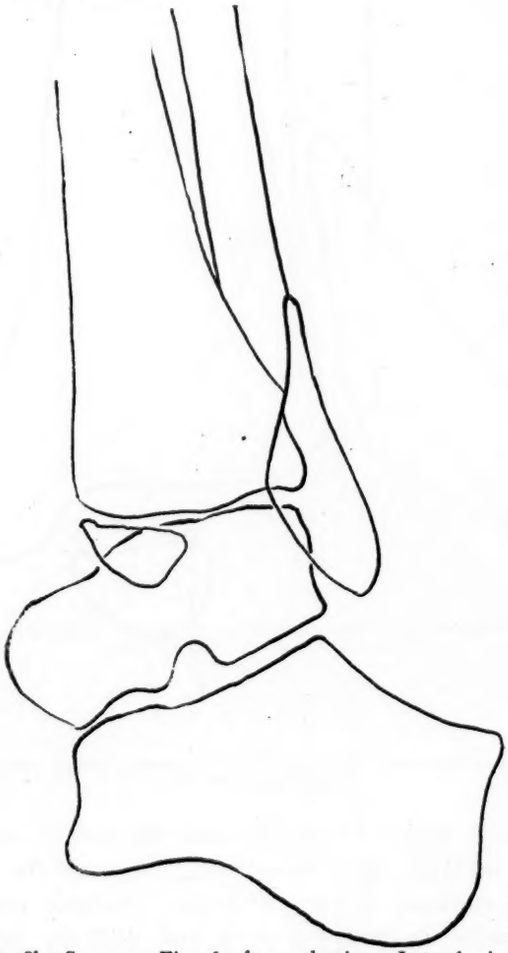

Fig. 8b—Same as Fig. 6 after reduction. Lateral view.

At the ankle joint Pott's fracture corresponds in frequency with Colles' at the wrist. Of the many cases I have seen, none has required operation despite marked displacement of the fragments. It is, I think, comparatively easy to secure almost perfect results by manipulation alone. As in Colles' fracture, it is necessary to reduce the fragments completely and to hold them accurately in their normal relationship. Figure 6 shows a typical case with somewhat more than the usual amount of lateral displacement owing to the fact that the patient walked several blocks on the injured foot. It is evident that there are two elements in the de-

formity—(1) lateral displacement, (2) posterior displacement. A correction of one is fully as important as that of the other. Two corrective motions are therefore required: (1) a sharp inward twist of the entire foot; (2) a forward pull on the heel combined with a dorsal shove on the shaft of the tibia. The foot must be held inverted and dorsally flexed, otherwise the fragments are bound to slip. When working with unskilled assistants, I prefer holding the fragments in position myself while applying the plaster-of-Paris dressing. This I do by means of two slings passed as indicated in

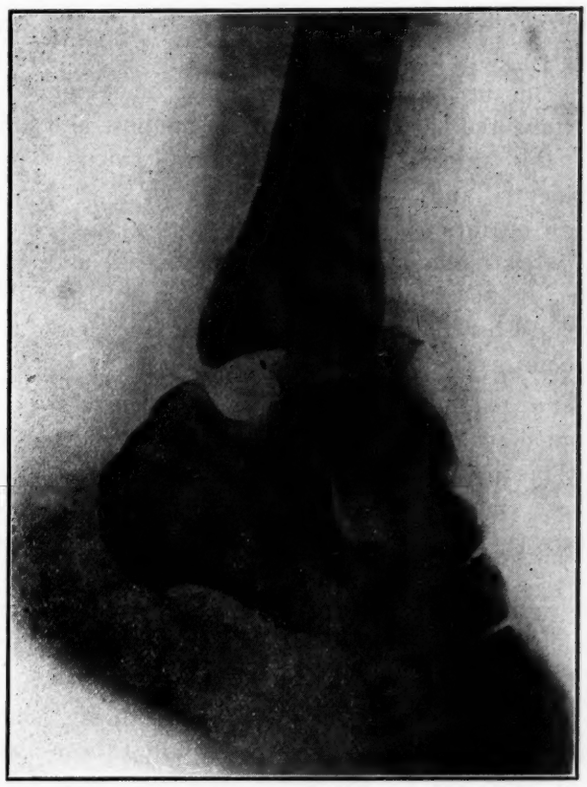

Fig. 9—Skiagram illustrating forward displacement of astragalus complicated by non-union of fracture of fibula.

the diagram, figure 7. Sling (a) passing over the posterior surface of the tibia, I press upon with my foot, thus drawing the tibia towards the floor; sling (b) passing around the os calcis, I draw towards the ceiling by passing it over my shoulders. Figure 8 is a skiagram of the case shown in figure 6, after reduction by this method.

Injuries to the astragalus ought not to be confused with Pott's fracture, but they frequently are. I have even seen a case demonstrated to a large class as a typical instance of Pott's fracture which was in reality a fracture of the astragalus. The *x*-ray, of course, gives the conclusive evidence. When the fragments are markedly displaced, no operation is as effective as astragalectomy. If their apposition is good, excellent results will be secured by simple fixation.

Dislocations of the astragalus are rare deformities. I myself have seen only one, a case in the service of Dr. Walter M. Brickner at the Broad Street Hospital, New York. This belonged to the extremely rare type of anterior dislocations of which only ten or fifteen have thus far been recorded. It was complicated by a fracture of the fibula about two inches above the ankle joint with a forward displacement of the lower fragment. (See figure 9). The heel of the patient appeared flattened, the internal malleolus was unduly prominent, the bulge of the astragalus could be distinctly felt anterior to the tibia and there was interference with dorsal flexion. A correct diagnosis had not been made at the time of the accident and when first seen by Dr. Brickner, some two months later, it was impossible to reduce the deformity by manual manipulation or by apposing the fibular fragments by open operation. Further attempt to reduce the dislocation by means of a Thomas osteoclast also failed. Open operation was, therefore, performed. The astragalus was found displaced about one-half inch forward. Even after complete division of all of the ligaments holding the astragalus in place, it was impossible to correct the deformity. The astragalus was, therefore, removed, the entire foot displaced backward, as in the typical Whitman method, and a plaster dressing applied holding it in this position. It is still too early to report the functional results in this case.

THE ADRENALIN TEST FOR HYPERTHYROIDISM

For three years Goetsch, of the Surgical Clinic of the Johns Hopkins Hospital, has been practicing the subcutaneous injection of 7.5 minims of a 1-1000 solution of adrenalin chloride in patients who present marked symptoms of hyperthyroidism but in whom no positive diagnosis can be made by ordinary methods of examination. If the patient, following the adrenalin injection, reacts with manifest symptoms of hyperthyroidism. Goetsch believes that a positive diagnosis of the condition is justified. The test is a valuable aid in determining whether the disease from which patients are suffering is purely a tuberculosis, a tuberculosis complicated hyperthyroidism, or a pure hyperthyroidism. Hyperthyroidism, whether or not associated with tuberculosis, will give a positive reaction to adrenalin. Tuberculosis, uncomplicated by hyperthyroidism, does not react positively to adrenalin.—NICHOLSON, CLIVE AND GOETSCH, in *The American Review of Tuberculosis.*

SURGICAL REFINEMENT AND IMPROVEMENTS, INCLUDING SOME FEATURES DEVELOPED BY MILITARY SURGERY*

THOS. O. BURGER, M.D.,
SAN DIEGO, CAL.

During my service of ten months in cantonments, in France, in casual camps and on the voyages to and from France, it was my privilege to meet several hundred medical men and invariably the most discussed topic was the future of the medical profession as regards changes and methods that are inevitable. Personally, my observations lead me to think that the correlated information which the Army presented through the medical fraternity, disseminated through the nursing corps and especially through the corps men, to the entire Army, will result in an enlightenment that will extend to the entire population of these United States. I must say that not all the medical men or all of their work was up to the standard, and some just criticism will tend to discredit the profession in the future, but on the whole, I feel that a salutory effect is to be expected.

The Army certainly awakened many medical men to the fact that they were in a rut and they will start over with a resolve to do better work—work that will stand the criticism of a more enlightened public. Questions of sanitation will be more easily handled. Epidemiology, and in fact all preventive medicine, will be given their proper attention and this by the way, brings us up to surgical considerations in the same light. With the opportunities that are to be had at the present time, any physician who attempts surgery, may learn a technic of varying scale. Also with so many doctors claiming to be surgeons, there is a big field from which the layman can choose.

While competition and the high cost of living are both increasing the surgeon who lasts will be the one with the conscience and whose final results will stand the test of time. Haphazard methods in hospital management and record-keeping will soon be a thing of the past. Standardization will come, —not for all hospitals perhaps nor will it be desired by all doctors, but I emphasize that both the institution and the man who has a conscience must embrace it.

This means that every case will be recorded as to why operated upon, along with complete data as to history and a description of the operative procedure. In black and white, open security will be the *results*. Since such an era is dawning, it is time for our profession, as represented in San Diego, to get in line. We all know and admit that operations are performed unnecessarily, improperly,—and without attempt at thorough diagnosis. Conditions are not fully weighed with consideration of the procedure best suited to that particular case. That the surgeon must have the cooperation of the internist, pathologist, roentgenologist and dentist is recognized as a necessity by those who desire to do conscientious, intelligent surgery. Focal infection may have been overemphasized in the last few years, but I doubt it. Internal secretions have not been sufficiently considered, but these things along with other essentials in the medical domain must be weighed in forming the basic element of the highest and most valuable surgical quality of today, which is preeminently and without doubt *surgical judgment* Is an operation to be done, when is it to be done, by what method, with what anesthesia, and with what other adjuncts so that the patient gets the greatest benefit with the least disturbance, risks and discomforts?

The general practitioner has progressed so far from those of the past that he is unwilling to submit his patients to be operated upon by a man whose end-results are more often than not, unsatisfactory through faulty diagnosis or poor surgery —e. g., removing an appendix when a calculus in the right ureter continues to cause the same distress and pain as before the unoffending appendix was removed.

Roentgen rays and radium are showing sharp competition with surgeons especially those who deal with the female pelvis, and one must learn when to yield his surgical skill to the application of these potent energies.

The surgeon who gives ether in every case and who follows the same procedure for every patient is in the same class with him who starves and purges each patient as a preparation for the operation. Such a surgeon is not modern and in addition is not even ordinarily observant else he would see the emergency cases which have no time for such depletion and disturbance of intestinal balance recover with less disturbance and in shorter time than the ones prepared in this usual crude way.

In my abdominal work my patients have had so few gas pains, (in many instances, absolutely none,) that some have sneered and even doubted when I have declared such to be the case. I do not upset the intestinal tract by purgation (in con-

*Notes from an address before the San Diego Co. Medical Society, June, 1919.

stipated patients I may give castor oil two days before) and I permit food up to the evening before which helps prevent acidosis. I do not handle the abdominal contents roughly or unnecessarily, nor do I pack gauze into the abdomen when it is possible to avoid this. I do not allow the intestines to lie on the bare abdominal wall or on iodized surfaces. Where the surfaces are necessarily exposed, I cover them with warm, wet gauze and I never leave a raw surface or peritoneal suture line in contact with the intestines if a mobile omentum is available for protection. These details, with some others, leave my patients practically free from gas pains and postoperative adhesions.

I will briefly discuss some of the outstanding improvements made in war surgery. Of most value and distinctly a new procedure is "débridement"—which was developed by the French early in the war. It was observed that cases that had been left on the battle-field in which maggots had eaten away all dead tissue, showed less infection and recovered more rapidly than those more repulsively infected and this gave foundation for the débridement treatment which simply means cleaning out all devitalized tissues.

All wounds produced by shell, or shrapnel, were potentially infected, and the procedure or débridement, meant not only removing all foreign material, but all flesh whose vitality was questionable even if it did not show foreign material or infection. This may be done early or may be done later. It was particularly demanded in gas infection—here very extensively. After thorough cleansing, some antiseptic or application was used. Morrison's paste or "Bipp" was popular with many surgeons. The iodoform no doubt exerted an antiseptic effect, though the paraffin was considered of most value in making an escape for secretions. Suturing was done in a very careful way, passing the needle so that no undue tension was produced, but at the same time so that no dead space was left, and also not so close that secretion and paraffin might not make its way to the surface. The wounded member was placed at absolute rest and kept so for a number of days.

Suturing large wounds as indicated above will result in primary union in more than 80% of cases.

Many of us have been convinced strongly regarding the Carrel-Dakin method of caring for wounds. Personally I was shown in the Base Hospital where I was stationed that this is a superior method of dealing with infected wounds, though only when used in a superior way to that carried out in the ordinary hospital or by the average doctor or nurse. The solution must be chemically right, the tubes properly made and placed, and with extreme care to all details, or the effort results in failure and may cause further irritation. I feel that in the usual surgeon's civilian practice dichloramine-T. is the preferable chlorine antiseptic to use.

The war has also shown the need of more frequent use of antitetanic serum, immediately after wounds, for repeated use in certain suspicious wounds, and preliminary to operation in old injuries where a dormant tetanus infection may be stirred up.

The aggregated cases of empyema in cantonments afforded opportunity for much study and comparison and great improvement in their treatment was effected. I feel that the instrument devised by Dr. Victor P. Dieterich for dealing with pus in the pleural cavity, not permitting air to enter, is of great benefit. While at Letterman Hospital I tried to do away with the pneumothorax and used a trocar getting the same results that Dr. Dieterich's trocar does, but with less facility.

Many other improvements will develop by reason of new methods evolved in military surgery, but of most value will be the enlightenment of a large number of doctors who have needed just such a stimulus to arouse them.

Surgery of the future will be more thorough, through greater cooperation, because laboratories have become an absolute essential to the surgeon—more clinical and *x*-ray men will be available and the truly progressive surgeon, as well as the internist, will find increasing demand for his services by the more enlightened public.

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ACUTE THYROIDITIS.

Acute thyroiditis, whether occurring in the normal gland or in a pre-existing tumor or hypertrophy, is of comparatively rare occurrence. At first thought, this fact might be difficult of explanation, for the close proximity of the gland to the pharynx, tonsils and lymphatic structures of the throat might well be expected to predispose to infections within the thyroid gland by direct lymphatic extension. A study, however, of the lymphatic supply of the thyroid demonstrates that there is no direct lymphatic circulation between the structures of the throat which are so commonly the seat of acute infections and the thyroid gland.—GEORGE E. BEILBY in the *N. Y. State Journal of Medicine.*

RHINOLOGIC CONSIDERATIONS FOR THE GENERAL PHYSICIAN AND SURGEON.*

FRANK ALBERT BURTON, M.D.,
SAN DIEGO, CAL.

This paper is intended for physicians in general practice. In treatment, the paper deals almost entirely with the surgical side of rhinology, but it should be remembered that non-surgical treatment plays an important rôle in rhinological practice.

In the consideration of this subject, effort is made not so much to direct attention to anything new in rhinology, but especially to consider the avoidance, as far as possible, of unnecessary surgery upon useful structures and most of all to urge greater care in the matter of rhinological diagnosis.

From recent observation I assume that even yet too many general practitioners and some beginners in rhinology are sacrificing turbinated bodies when the fundamental cause of the nasal symptoms under consideration is not with the turbinates *per se*. Deviated septa, infected sinuses, diseased tonsils, root abscesses, or hypertrophied lymphoid tissue in the nasopharynx, are often primary causes of nasal stenosis. Tertiary syphilitic manifestations and diseased or abnormal conditions of other structures causing turgescence of the turbinates, must receive attention. Conditions producing symptoms which, when associated with some form of rhinitis, make it difficult to determine the fundamental etiology, demand special consideration. Sphenopalatine ganglion neuroses must not be overlooked. Headaches and eye conditions of nasal origin, must receive studious attention.

In the important matter of diagnosis, sufficient time and great care should be given. Where purulent sinuses are suspected, too much reliance should not be placed upon transillumination, astringents and negative pressure. The *x*-ray should also be employed. Snapshot diagnosis and following the lines of least resistance in rhinological practice are vicious habits. In the recent army draft a goodly number were refused admission into the service because of loss of, or marked impairment in, functions of the turbinated bodies due to surgical interference.

It is not my purpose at this time to discuss the different methods of surgical attack upon the turbinated bodies, but rather to urge that the turbinates be exempted from any surgical procedure whatever until painstaking examinations determine them to be unmistakably at fault in the causation of symptoms from which the patient is suffering. And when it is determined that in a given case impairment in nasal respiration, nasal drainage, or symptoms of nasal irritation, call for surgery of these important structures, that one consider well their functions and do that which will produce the desired results with the least possible loss in nasal physiology.

All are familiar with the anatomy and physiology of the turbinates, but a few general statements with reference to their physiology will serve to refresh our memories and contribute to the purposes of this paper.

When one considers the important functions of the turbinated bodies as well as the far-reaching and detrimental results from loss, or even serious impairment, of their physiology, he can but exclaim, "What wonderful and what valuable structures! What a wise provision of Nature to provide in this splendid way for the tempering and moistening of the inspired air!" When one reflects that the turbinates also contribute very largely, through special moisture supply, to the efficacy of this tubal air filter for the removal of dust and bacteria from the air one breathes, the importance of conservative treatment of such necessary structures is obvious.

In the consideration of nasal pathology it is important to recognize among other things, the difference in appearance between intumescence and hyperplasia of the turbinates, as well as to note the difference in response to local application of adrenalin and cocaine. In intumescence the color is pink, almost red, the surface is smooth and even, the erectile tissue shrinks to normal dimensions on application of adrenalin or cocaine, and with nasal probe no movable tissue is demonstrable at the inferior border of the turbinates. While with hyperplastic rhinitis the turbinate surface is pale pink, often bluish pink, nodular, or at least uneven, and on the application of adrenalin or cocaine fails to shrink to normal size, and leaves movable tissue at the lower edge of the turbinate bodies, and by means of the probe one can determine the extent of the hyperplasia.

If the cause of turbinate congestion is improper ventilation, sedentary habits, pus bathing, or chemical toxins from empyema of one or more of the nasal accessory sinuses, negative pressure on account of a deflected septum, or non-use of the nose from post-nasal obstruction, it is obvious that turbinate surgery will fail to give relief and unless it

*Read before the Southern California Medical Society at Riverside, May 15, 1919.

is most conservative, will impair nasal physiology. In such cases the turbinate manifestations are only symptoms, and removing part or all of such turbinates will have but little influence upon their etiological factor. Nervous individuals are frequently affected with hyperesthetic rhinitis, hay fever, and intumescent rhinitis. In the matter of rhinological diagnosis and treatment in such cases, one does well to also take the nervous factor into account. The erectile tissue of the nose should respond to slight changes in atmospheric conditions. Lack of vasomotor control often results in nasal respiratory unbalance. Certain stimuli cause vasomotor dilatation and the nasal erectile tissue fills with blood. Certain other stimuli produce vasomotor constriction and this tissue is depleted of its blood.

From continuous vasomotor dilatation of the turbinates, venous stasis results. Venous stasis is the most frequent cause of nasal stenosis. In a given case the fundamental question is what causes the venous stasis? Not infrequently this condition results from negative pressure due to a deviated septum and since the suction thus exerted is constant, it need be but slight to produce serious consequences. In breathing dry air in overheated rooms, the turbinates are whipped into great activity in their effort to moisten the inspired air. Individuals continuously subjected to such air have constant vasomotor dilatation, impaired tone of nasal erectile tissue, and resulting venous stasis. From lack of vasomotor control nasal respiratory unbalance takes place, and often there is alternating nasal stenosis, one of the classic symptoms of intumescent rhinitis.

Intumescent rhinitis is due to lack of tone and loss of vasomotor control with practically continuous relaxation of the contractile elements of the erectile tissue of the nose. Improperly heated and ventilated apartments, sedentary habits of life, or the reverse—overdoing physically or mentally to the point of fatigue—worrying excessively, too much society and too little sleep, through lowering vitality and tone, are important causative factors of intumescent rhinitis. A deflected septum may be the fundamental cause of congestion or hyperplasia of the turbinates and direct cause of blocking sinus drainage, resulting in acute sinus infection as well as accounting for the fact that the infected sinus fails to heal spontaneously but develops into a chronic process. Continuous hyperemia, with consequent hypernutrition, account for the hyperplastic condition of the turbinates.

Pharyngitis, laryngitis, tracheitis and bronchitis are often due to great impairment in or loss of turbinate function, as well as to mouth-breathing from nasal or post-nasal obstruction. In either case there is failure in the proper preparation of the inspired air, due to impossible turbinate function.

In nasal stenosis, from whatever cause, to provide the proper aeration of the blood through nasal respiration, excessive nasal respiratory effort is necessary, and when stenoses are due to deviated septa there are certain to be negative pressure points, causing vasomotor dilatation followed by venous stasis, resulting in intumescent rhinitis.

Where the nose is narrow, due to constriction of bony frame-work, the inferior turbinates may swell so as to completely close the nostrils and make mouth breathing necessary, even though the normal air current is higher up in the olfactory region on a level with the middle turbinate. This condition may also interfere with the sense of smell and the sense of taste. Pressure of middle turbinate against septum by catching the olfactory nerve filaments is perhaps most often the cause of impaired smell, but it should be remembered that in a large per cent. of the cases pressure is primarily due to a deviated septum or septal ledge, and submucous resection is the indicated intranasal surgery, not turbinectomy or even turbinotomy.

Unless one acquires the habit of very great conservatism in surgery of the turbinates, he will too often choose turbinotomy or even turbinectomy, when submucous resection of the septum, sinus surgery or some surgery or treatment not turbinal, should have been the procedure of choice, and later prove to be necessary, and surgery of the turbinates prove too late to have been unjustifiable.

Many laymen consider mouth breathing harmless, and though nasal respiration be impossible, unless the nose bleeds or causes dicomfort in some way, they fail to consult a rhinologist. The teaching of nasal physiology should be given the emphasis that its importance demands.

It has long been recognized that nasal reflexes are often due to contact of the mucous membranes of turbinates and septum. In the vast majority of these cases it will be found that deviated septa are the primary causes and call for submucous resection rather than turbinotomy. Contact points between turbinates and septal spurs and ledges are best corrected in most cases by submucous resection, as there is nearly always a deviation of the septum associated with these conditions. Likewise, synechia between the turbinates and septum

is often due to septal deviation and in such cases is best corrected by submucous resection.

Several different ear conditions are often caused by nasal stenosis, and not infrequently venous stasis of the turbinates is the direct cause, while the fundamental etiology is deviation of the septum, infected sinus or conditions other than of the turbinates themselves.

Every rhinologist has seen cases of turbinate turgescence or hyperplasia due to the several causes enumerated above. I shall report a case or two illustrative of the necessity of great care in the matter of diagnosis:

MRS. R. was referred to me for relief from pain behind the left mastoid and from frontal and temporal headaches. In an effort to remove the cause of her symptoms, another oto-laryngologist had performed a tonsillectomy without benefit. Eye findings were negative. Upon careful examination of her ears, nose and throat I failed to find objective pathology sufficient to account for her symptoms. There was pressure contact of the left middle turbinate against the nasal septum and outer wall of the nose. The septum was in the median line. It appeared that the impairment in ventilation and sinus drainage, as well as possible nasal reflexes thus produced, could be relieved only by middle turbinotomy. Following my habit, however, of making still further investigation when the sacrifice of turbinate tissue seems necessary, the case was studied from the neurologic aspect. The young woman was very neurotic. Investigation from this point of view resulted in a diagnosis of spheno-palatine ganglion neurosis. I applied a swab of 90% cocaine over the ganglion after the method of Sluder, but as this aggravated rather than decreased the symptoms, I did not inject Meckel's ganglion. A middle turbinotomy was done, but instead of giving relief it appeared to accentuate her headaches. The patient had had a negative Wassermann reaction, but after consultation with a local nerve specialist she was put on anti-luetic treatment, showed improvement for several months, but at last report was suffering as before.

For some time the inter-relation between the turbinates and the generative organs has been recognized. The following case is of interest in this connection:

MRS. A., a young newly married woman, was referred to me for nasal stenosis. Upon careful examination the turbinates, especially the inferior, were found engorged with blood. Upon application of cocaine they diminished to normal size and there was no movable tissue at their inferior borders. There was a marked deviation of the septum which was presumed to be the primary cause of the intumescent rhinitis. A careful, thorough submucous resection was done and the nose properly treated until healing was complete. Several weeks following the date of the post-operative healing the patient reported but slight, if any, improvement in nasal respiration. Further careful study of her nasal condition was made and the conclusion reached that sexual irritation might be a factor. A heart-to-heart talk with the husband was soon fraught with much more favorable results than the supposedly much-needed submucous resection. A few months later the young woman reported complete relief from the nasal stenosis. It is possible and probable that the submucous resection was a factor in this eventually, favorable outcome, but I believe only a factor.

I have observed other cases in which there was obvious inter-relation between turbinated bodies and sexual irritation.

From the viewpoint of turbinal congestion from gastro-intestinal intoxication the following case is of interest:

MISS J., teacher, under treatment for chronic catarrhal otitis media, suffered from time to time with intestinal fermentation. At the time of these spells of indigestion she had "stuffiness" of the nose, as well as increase in her ear symptoms. I had the opportunity of examining her turbinates during two intestinal attacks, and each time there was increased redness and marked turgescence of these bodies.

From time to time turgescence of the turbinates and certain other nasal conditions, are due to chemical toxins from root abscesses or pyorrhea and the services of a competent dentist are imperative. I feel that too much emphasis cannot be placed upon this point, because not infrequently general physicians pay but little attention to the pathology of the mouth. As a natural consequence, in conditions under treatment, caused by mouth foci of infection, the patient fails to obtain the result to which he is entitled.

No examination should be considered complete without investigation of the teeth.

The following hypothetical case, a victim of civilization, represents rather a large list of patients who call upon the oto-laryngologist. The patient may be male or female, but is more likely to be the latter. She is absolutely afraid of fresh air and keeps her room temperature regularly at 70°. The room is heated by steam, gas stove or oil heater with flame exposed. She is positively terrified when she has any symptoms of a cold, at once runs the temperature up to 75° and maintains this temperature day and night for twenty-four to forty-eight hours with doors and windows closed. She never gets out into fresh air without heavy wraps, indulges only in shallow contracted breathing, prefers to ride, and if she walks moves slowly. She has but little appetite and what she eats is unwisely chosen.

Constipation results, and there is more or less toxemia from the gastro-intestinal tract. She is terrified at cold water, and takes only warm baths in a hot room. Such an individual is certain to develop intumescent rhinitis and sooner or later visit the rhinologist. When she calls there is often a mistake in diagnosis and consequently in treatment, due to failure in locating the underlying cause of turbinate condition. In the supreme matter of rhinological diagnosis cooperation should be obtainable —cooperation of patient, general physician, dentist and rhinologist.

It is true that surgery of the septum is frequently indicated and when indicated and properly performed, improves and never impairs nasal function, but it should be remembered that no septal surgery is justifiable without sufficient symptoms traceable to the septum as a causative factor. The fact that the septum in a given case is a little out of line, or even considerably out of its normal shape or position, is not sufficient reason for surgical attack. When turbinates are enlarged one should determine the fundamental cause, remove the cause and save the turbinates from surgical interference if practicable.

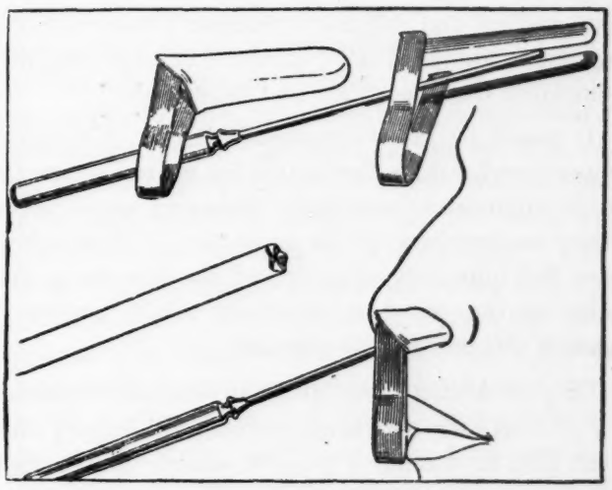
The delicate nature of the mucous membrane of the nose should be constantly borne in mind and unnecessary traumatism in nasal treatment or surgery should be avoided. The general practitioner and the surgeon is frequently called upon to control nasal hemorrhage and too often he attempts to pack the nose without good reflected light, nasal dilator and other necessary instruments.

In successfully controlling nasal hemorrhage the first step is that of determining the location of the bleeding point; next, the application of astringents or pressure upon the bleeding area; then, when the hemorrhage is controlled, applying a chromic acid bead to the point from which the blood was escaping. For several days following this the involved area should be kept soft and moist by applications of sterile petrolatum *ad libitum*. This can be done by the patient or another member of the family.

Nose bleed is most frequently from the anterior third of the septum and a septal ulcer is usually the cause. In nasal bleeding of elderly people high blood pressure often demands attention. To prevent traumatism all nasal packing, whether post-operative, to control nasal hemorrhage from other traumatism, or intransal splint in fracture, should be within rubber tissue finger cots, or by cigarette-shaped gauze packs rolled in rubber tissue, or strips of gauze thoroughly impregnated with sterile petrolatum. This provides for comparative freedom from traumatism and the removal of packing will be free from pain and probably unassociated with bleeding. To facilitate packing of nose within a rubber tissue cot I have devised a simple, inexpensive instrument (made by B. Mueller & Co.,) for holding the cot open in the nose while the packing is being placed also a simple nasal packer. These instruments serve their purpose well. (See illustration.)

Post-nasal packing is seldom required and should not be done unless absolutely necessary. Nasal or post-nasal packing should be removed within twenty-four hours.

When surgical relief from chronic foci of infection is sought, it should be remembered that immediate favorable results are improbable. A body permeated with chemical toxins cannot with reason be expected to recover immediately upon the removal of the source of infection. Time is a factor. Careful attention to the processes of elimination should be given.



The use of chemical and galvano-cauterization in the nose is sometimes indicated, but when employed it should be with care and caution. Opposite mucous surfaces must not be cauterized and only the smallest area conservative with results to be attained.

In the nose the cautery is used but little, by rhinologists. By the general physician it is used too much, with resulting impairment of nasal function. Not infrequently a patient tells us of some physician "burning out his nose" and occasionally we learn of a physician's effort to overcome nasal stenosis by dilating the nostrils with forceps.

This is an age of specialization in every department of life and in medicine and surgery one is at-

tempting to cover too much territory, who specializes "in diseases of men, women and children."

No general surgeon should try to do the surgery of the specialties for he cannot do it in a creditable manner. One who is a leader in general surgery is not likely to indulge in rhinological surgery. It is usually the mediocrity in general medicine and surgery who attempts to cover the whole field. He is not qualified to perform a submucous resection, so he follows the line of least resistance and attempts to overcome impairment in nasal respiration by removing the inferior turbinate on the side of convexity of the nasal septum—or he removes the inferior turbinates on both sides—disaster results.

In a given case turgescence of the turbinates may be rightly ascribed to chemical toxins from diseased tonsils. In such a case nothing less than complete enucleation of the tonsils will bring the desired results. From the viewpoint of focal infection, tonsil stumps may do even greater harm than before operation.

In rhinology, trustworthy diagnosis and competent medical and surgical treatment require special judgment and skill only acquired through definite competent training, study and experience.

It would be just as reasonable for a rhinologist to perform laparotomies as it is for general surgeons to do submucous resections, accessory sinus operations and surgery of the turbinates, and in either case the imperfect surgery and the disastrous results to the patients would be silent profanity against the unqualified operator.

Only in districts unsupplied by specialists should the general surgeon attempt rhinological surgery and even then he should, if possible, obtain the services of a competent rhinologist a day or so a week or month, as conditions demand.

In conclusion: Judicial treatment of turbinate bodies rarely calls for turbinectomy. From time to time in hyperplastic rhinitis, purulent involvement of the ethmoid labyrinth and some other intra-nasal conditions, middle turbinectomy is indicated. Inferior turbinectomy is almost never indicated. Middle and inferior turbinotomies for purposes of nasal ventilation and drainage, as well as for removal of nasal reflexes, are more often needed. No turbinectomy, turbinotomy, or any intra-nasal surgery whatever, should be done except after thorough, painstaking examination and careful diagnosis.

SOME PHASES OF ROENTGENOLOGY AND RADIOTHERAPY.

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From the time when radium was discovered by Madame Curie steady advancement has been made in the therapeutics of this agent. It has supplanted the *x*-ray in some instances, and has certainly incited the manufacturers of *x*-ray machines and tubes to greater efforts to compete with its therapeutic value.

The part which the *x*-ray plays in the diagnosis of bone lesions is well established, and its use is so universal by those who desire to do the best work that this phase of the subject need not be especially considered. However, it is well that the surgeon remember there are lesions, such for instance as those in beginning Pott's disease, where destruction occurring in the overlying soft structures will not be visible in the roentenogram of the vertebræ, and under such circumstances one should not rely entirely upon the *x*-ray diagnosis.

In fractures and dislocations the surgeon who first determines by roentgenoscopy the exact condition present, and after correction or reduction checks his work by another examination, should naturally obtain the best results. The aid which the *x*-ray affords in the differentiation of osseous lesions is well known to all of us.

In abnormalities of the gastro-intestinal tract there are certain signs whereby the roentgenologist may make a positive diagnosis; but in most instances after he has rechecked his work to guard against error,—with plates, anti-spasmodic solutions and subsequent examinations,—he can only report his findings to the internist. This is especially true when examination is made to determine if possible the presence or absence of calculi in the gall-bladder, or the urinary tract, present roentgenoscopic methods being inadequate to demonstrate more than thirty-three and one-third per cent. of the concretions actually existing in these situations. Therefore, the internist should make the final diagnosis based upon his interpretation of the data obtained by clinical and anamnestic investigations.

When a patient is referred to the roentgenologist, under the assumption that he can positively determine whether or not calculi are present, the patient is confused when the surgeon receives a negative report—and at operation a number of calculi are discovered. This is also true when the

patient, knowing of the negative report, refuses surgical intervention despite the fact that all the clinical symptoms indicate the presence of calculi. In such instances the clinician may sometimes conclude that the roentgenologist failed in proper execution of his part of the work. How easily this confusion could be foreseen and obviated if the clinician and the surgeon would frankly explain the facts to the patient, and especially the part which the *x*-ray plays in diagnostic confirmation under such circumstances. The patient could then go to the roentgenologist fully understanding his status and not regard the report of the laboratory as final evidence which so frequently happens under present conditions.

The interpretation of chest pictures has always been a source of controversy among roentgenologists. There are workers in this line who make a positive diagnosis of pulmonary tuberculosis based upon the presence of peri-bronchial thickening; whereas others are more reserved in their opinions. The importance of early recognition of pulmonary tuberculosis is thoroughly understood, and roentgenologists are to be commended for their efforts to establish a diagnosis in the earliest stage possible; but it would seem that a better understanding should exist between the internist and the roentgenologist, the latter reporting his findings to the former not as conclusive but as substantiating or contradicting the clinical data.

Stereoscopic pictures are becoming deservedly popular, but the attitude of extremists who specialize in that field is oftentimes ridiculous. Anyone familiar with *x*-ray interpretation can read a flat plate. However, there are some who, owing to unilateral visual defect, cannot read a stereoscopic set. It is perfectly true that while the stereoscopic-roentgenologist may be able to see more by his method, his ability to read a flat plate is limited only by his knowledge of *x*-ray interpretation.

Where stereoscopic pictures are taken "up and down" and laterally, it is to my mind just as essential to make a flat plate against which to check the stereoscopic readings, in that way overcoming the tendency of seeing too much in the stereoscopic pictures. Dr. Chamberlain, of New York, as a routine measure takes two stereoscopic sets and a flat plate, and then checks the one against the other.

In my opinion there is an undoubted advantage in stereoscopic pictures of the head, chest and pelvis, also in the localization of foreign substances, especially in joints; but under other circumstances they constitute a nicety rather than a necessity.

In the treatment of malignant disease the surgeon and the radio-therapeutist seem to be striving to supplant each other. The only feature upon which all are agreed is that we are sadly in need of a cure for cancer. How much better it would be if the limitations of each could be definitely established, and each assume his legitimate part in the treatment. The attitude of the surgeon has never seemed quite fair, but this may be due in part at least to the extravagant claims made by certain radiotherapeutists.

In the therapeutics of malignant disease both by the *x*-ray and by radium, great advancing strides have occurred through the perfecting of *x*-ray machines and *x*-ray tubes, and a more intelligent understanding concerning the application of radium. The action of the *x*-ray and radium on the tissues is almost identical. In both we have the *Alpha, Beta* and *Gamma* rays, the two former being "screened out" for deep therapy. In applying either radium or the *x*-ray we screen with the same object, i. e., to permit the use of the soft rays for superficial lesions, and the hard or penetrating (Gamma) rays for deeper structures. However, the method of application necessarily differs. There are anatomic situations where radium is preferable because of accessibility rather than the production of any different action by the rays. In the case of an isolated neoplasm radium emanation tubes might be inserted into the mass which could thus be radiated from all angles. This is ideal but impractical, because there are few places in this country where emanation tubes are obtainable and the cost of radium is such that a sufficient quantity is beyond the means of the most of us. An *x*-ray machine with a nine inch spark-gap may be had in every city, and if cross-fire treatment be intelligently applied equally satisfactory results may be anticipated, excepting in anatomic situations which can be directly reached by radium and are inaccessible to the *x*-ray. Where large areas are to be treated, the *x*-ray is much to be preferred on account of the shortness of time in giving the dose.

The greatest trouble between the surgeon and the radio-therapeutist is due to the fact that each has seen the failures of the other. For instance, an individual with neglected mammary carcinoma will go to the surgeon who operates and then refers the patient to the therapeutist; the latter, with the idea of ascertaining the extent of the disease, will make a roentgenoscopic examination and find mediastinal gland involvement, which may have been present at the time of the operation for all he

or the surgeon knows. On the other hand, how many patients suffering from malignancy have reached the surgeon after months of futile treatment by the radiotherapeutist, when the disease might have been eradicated by surgery undertaken in time.

It is generally conceded that benefit accrues from radiation of operable malignant lesions prior to operation, especial attention being devoted to points of possible metastasis. The after-radiation has been so generally adopted that it need not be mentioned, excepting to emphasize the fact that unless radiation be practiced with thoroughness and all points of metastasis rayed, instead of doing good the treatment may act as a stimulant to any remaining pathology.

In the treatment of lesions involving the female generative tract, particularly the cervix and uterus, there exists considerable divergence of opinion between the *x*-ray therapeutist and the one using radium, the radium exponent claiming superiority owing to the more direct action of the rays by the insertion of radium into the uterus. The question of rendering the patient sterile should not be overlooked in the choice of the agent to be employed. To produce enough rays through the uterus by radium, there must necessarily be caused a change in the uterine membranes with consequent impairment of generative function. Therefore, in patients before supervention of the menopause I should first consider the *x*-ray; during or after the menopause either the *x*-ray or radium may be used, or a combination of both may be preferable. There are cases where neither will cause cessation of the discharge, pain, or reduction of the tumor, but when used together the desired result may be obtained.

The question as to the dividing line where a lesion should be considered surgical or be subjected to radiotherapy is a most perplexing one, and it is to be hoped greater knowledge concerning application of the Gamma rays will later solve this for the radio-therapeutist. It would certainly seem to me that the surgeon, who has had complete charge of such cases for years, should have something to say about the treatment; and it is necessary for the therapeutist to prove his ability to cope with them, as well as recognizing defeat in some instances, before he can expect the whole-hearted support of the surgeon. We know radiotherapy will reduce the size of a fibroid tumor; it is also true in some cases that much benefit is obtained by alleviating the distressing symptoms without apparent change in size of the tumor; or the tumor may be reduced in size but still be palpable. The determination of when surgical intervention should be instituted in such cases would certainly foster a better understanding between the surgeon and the therapeutist.

In the treatment of exophthalmic goiter technics have been perfected to such an extent that all surgeons realize the importance of the *x*-ray and radium, and the only feature the therapeutist has to guard against is attempting to do too much. There are cases which do not react kindly to the rays, and I have found that changing to massive treatment, or to fractional doses, will frequently produce the desired result. When several technics have been utilized and no benefit has accrued, the therapeutist should recognize defeat in that particular case and return the patient to the surgeon or the internist.

In the treatment of skin diseases the *x*-ray and radium play an important rôle, and the only dermatologists I know today who do not recognize this fact are those who are unfamiliar with the proper use of these agents. It does not seem entirely safe, however, for anyone operating an *x*-ray machine or having radium in his possession, to assume the management of skin diseases; the treatment should be administered by the dermatologist, or under his direct supervision, and the results obtained be carefully noted by him. In applying massive doses the one employing them should be familiar with the course of the particular lesion being treated as well as any reaction resulting from the use of the rays; and in fractional doses should have a thorough knowledge of the cumulative effect of *x*-ray and radium radiations. If these features are not understood and remembered, and records of the dosage kept, the most experienced radiotherapeutist may cause serious damage to the skin.

In regard to the question of preferability of radium or the *x*-ray in the treatment of skin lesions; I have obtained better results in the treatment of keloids, lupus erythematosis, nevus-vasculosis, and nevus-cavernosum, with radium than with the *x*-ray. I have treated one hundred and fifty-six skin epitheliomata with the *x*-ray, and between twenty-five and thirty with radium, by massive dose radiation. The question of choice of technic in the treatment of skin epithelioma will not be considered, other than to say the only man who is employing fractional doses with exceptionally good effect is Dr. W. A. Pusey; and his favorable results are considered due to his wide experience and skill in handling the *x*-ray. The majority of operators are employing the intensive treatment, and

most of those who have changed from fractional to intensive report a more favorable outcome from the latter method of procedure.

My results have not led me to give either the *x*-ray or radium any decided preference. Where the lesion is too large to be covered by one application of radium, the fear of overlapping is obviated by *x*-ray treatment and an absolutely even radiation thus assured. There are, of course, some lesions involving the buccal cavity and throat where radium may be directly applied, and in such cases radium is naturally superior to the *x*-ray.

In skin lesions where the involved areas are large and numerous, fractional doses with the *x*-ray are considered more beneficial; moreover, the use of radium would be impossible because of the time which would be required for treatment. In psoriasis, eczema and lichen planus, where the lesions are quite generally distributed, the *x*-ray in fractional doses is preferred. One would hardly attempt to treat such cases with radium as the time required would make this impracticable, and good ultimate results may be secured, and usually there is almost immediate relief from itching, especially in lichen planus, by application of the *x*-ray.

The question of causing telangiectasis, *x*-ray dermatitis or *x*-ray burns, is a most vital one to the radio-therapeutist. The seriousness of producing any of these conditions, and especially the latter two, is too constantly borne in mind by anyone employing the rays. A careless departure from recognized technic may be the cause of untold misery and suffering on the part of the patient, as well as the realization of error and a constant reminder to the therapeutist. We may talk of an idiosyncrasy of individuals to radiation, but such instances are very few and far between. The great fear of the student of radio-therapeutics is not that his efforts will be discredited, but there will always be certain workers in this field who will attempt to do too much without being able to recognize the limitations of radiation as we understand them today.

There is nothing original in this contribution and no attempt has been made to dictate any policy, the various phases of the subject being merely touched upon lightly. The sole object is to state facts as I see them with the hope that a better understanding may be forthcoming between the roentgenologist, the radio-therapeutist and those working in other branches of the profession. There is room for all of us in the medical profession, and the roentgenologist and the radio-therapeutist have attained an important position. It is to be hoped that each branch of medical science will maintain its place and incidentally not encroach upon the legitimate domain of others.

Letter to the Editor

MEDICO-LITERARY MISAPPLICATIONS AND AMBIGUITIES.

New York City, August 25, 1919.

The article on this subject by C. C. Mapes, in the August, 1919, issue of THE AMERICAN JOURNAL OF SURGERY is both interesting and valuable as a pointed argument for the use of more correct terminology in medical literature.

There are several instances, however, to which I believe exception may be taken.

The Greek prefix *gono* truly enough means *seed,* but this is neither its most common meaning nor its only one. Its two most common uses are "offspring" and "parts of generation." It is very likely that in the word gonorrhea the meaning intended was a flowing from the organs of generation. So there is a rather clear indication of the origin of the flow and of its point of emergence.

The term *Neisserian urethrorrhea* falls short in about the same way, inasmuch as though it indicates the causative by the prefixed "Neisserian" and the point of emergence, it ignores a clear expression of the origin of the flow.

Granting that we are applying the term *gonorrhea* or the term *Neisserian urethrorrhea* to the disease in question, what is there incorrect in using either of these terms adjectively to indicate the nature of a complication as endocarditis. This is parallel to the use of such adjectives as *naval* in the expression *naval hospital,* and *animal* in *animal hospital.*

The common Greek word for seed (semen) is *sperma,* from which is derived our word *spermatorrhea.*

One of the most misused words in our medical terminology is *catarrh.* This is derived from the Greek words *kata*—away from, down from, and *rheo*—to flow. It has come to mean, at least, in common parlance, any chronic inflammation of the nasal tract, accompanied by a discharge.

Except in special instances where there is obvious objection it would seem that words fully expressive could be derived from the combination of the word *rheo*—to flow, with prefixes showing the source of the flow—urethra, etc., supplemented by adjectives showing the causative such as Neisserian, etc.

It would be highly gratifying if we might have a Board of Medical Terminology, actively functioning in this field, much as the National Board on Geographical Names serves in that connection and several other instances in kindred fields of endeavor.

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WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, SEPTEMBER, 1919

THE INTERPRETATION OF ROENTGENOGRAMS.

One of the most valuable diagnostic possessions that the surgeon can—and should—acquire is the ability to interpret *x*-ray plates; to distinguish between an artifact and the tracing of a real lesion, between the shadow of a phlebolith or calcified lymph-node and that of a calculus, between an ununited epiphysis and a fracture; to recognize in roentgenograms of the gastro-intestinal tract the physiological, the functional and the grossly pathologic; in chest pictures the lung cavity, the abscess, the effusion, pneumothorax, thickened pleura; and, above all, to differentiate by the peculiarities of their finer traceries on the plate the various inflammatory, neoplastic and traumatic diseases of the bones and joints: tuberculosis, syphilis, pyogenic infections, and the many varieties of bone tumors.

A gumma of the bone may resemble in the roentgenogram a sarcoma, and if the distinction is not made by carefully studying the details of the plate an unnecessary amputation may be performed. The recognition of an osteal carcinoma, scarcely possible by one not a good student of roentgenograms, clearly indicates a search for a primary lesion elsewhere as would also, for example, the tracing of a sarcoma of the lung. To distinguish in the shadows the periostitis of pyogenic infection from that of syphilis, spina ventosa from luetic dactylitis, is clearly very important, yet not by any means easy. We need not multiply instances to emphasize the argument.

The surgeon who is unable to differentiate *x*-ray appearances is handicapped in that he is dependent upon the interpretation of the roentgenographer who may be both experienced and astute and may be neither.

The best means of learning roentgenographic interpretation is, of course, by close observation of many plates, balancing their appearances against clinical, including operative and bacterial, findings. This may well be supplemented by reference to *x*-ray atlases, as, for example, that of Grashey. As a guide however, that will help much to avoid errors, a reliable manual of differential *x*-ray diagnosis is also desirable, especially for the novitiate. We have, in fact, been led to write this by the recent appearance of an excellent manual* of this sort in which the most important data are presented so clearly and succinctly that we feel impelled to call attention to its merits. We commend its study to those who appreciate the wisdom of learning for themselves the diagnostics of the *x*-ray plate.

* Roentgen Interpretation. By George W. Holmes, M.D., and Howard E. Ruggles, M.D. Lea and Febiger, 1919.

SURGICAL AND PULMONARY TUBERCULOSIS IN THE UNITED STATES.

There are no statistics available by which we can determine the morbidity and mortality of surgical tuberculosis in the United States, but knowing that tuberculosis of the tissues other than the lungs is common in surgical practice, we may approach some rough estimate of its extent by contemplating the known incidence of tuberculosis in general, and the official figures for pulmonary tuberculosis.

Tuberculosis causes annually one hundred and fifty thousand deaths in the United States. Estimating from the figures of the United States Census Bureau for 1916, fully six per cent. of these deaths were from surgical tuberculosis, and probably the percentage is considerably higher. During the examination of men for the National Army sixty-nine thousand were rejected by the Draft Boards on account of tuberculosis and twenty-two thousand more were rejected for the same reason on arrival at camps. We have not the figures for tuberculosis in the American Army during the year 1918 but in 1917 nearly four per cent. of the deaths among the enlisted men were caused by tuberculosis and thirty-one and a half per cent. of the discharges from the Army in the same year were on account

of tuberculosis. It is safe to estimate that ten thousand American soldiers developed tuberculosis during the war.

These figures startlingly indicate the extent of tuberculosis in this country and demonstrate the need for continuing an active campaign to combat the menace. The National Tuberculosis Association is planning a drive during the next few months which should enlist the intelligent support and assistance of the entire profession in which, as the above data indicate, the surgeon should play no inconspicuous rôle.

AN INFORMATION SERVICE FOR VISITING PHYSICIANS.

New York City is unsurpassed in the number and variety of its surgical clinics. To direct physicians to the hospitals where they can see the surgeons and the surgical work they are interested in the JOURNAL maintains in its publication office a Clinic Information Bureau which is at the service of all visitors.

The Surgeons of Greater New York are invited to send to the JOURNAL office information concerning their clinics and operating schedules that will be of interest to visiting physicians.

Surgical Sociology

Ira S. Wile, M.D., Department Editor.

NEGROES IN PROFESSIONAL SERVICE.

The Negro population of the United States is so large that it merits careful study, not merely from the standpoint of industry, but also that of public health. The total number of the negro population in 1910 at the age of ten years and over was 7,317,922, of which 87.6 per cent. were distributed throughout the southern sections of the United States. One naturally inquires as to what percentage of negroes are engaged in professional pursuits. In 1910, there was one negro in professional service to every 146 of the negro population, as compared with one to 51 among the whites. This disparity is by no means as marked as becomes evident in considering those giving professional service along lines distinctively related to public health. For example, there was one negro dentist to every 20,560 negroes, where there was one white dentist for every 2,070 of the white population. Of physicians and surgeons there was one negro to every 3,194, and one white physician and surgeon to every 553 of the white population. Trained negro nurses were one to every 4,039, while there was one white trained nurse to every 1,024 of the white population. The ratios for veterinary surgeons was one to every 80,555 for negroes, and one to 7,292 for the whites.

One is wont to think that semi-professional exploiters such as fortune tellers, hypnotists, spiritualists are far more numerous among the colored than the white populations, but as a matter of record in 1910 there was one of this group to every 98,278 negroes, and one to every 55,150 among the whites. Even the alleged healers were more numerous among the whites, where they were in proportion of one to 12,715 of the population as compared with one negro healer to every 29,602 of the colored population.

Fortunately, there is a marked increase in the development of professional classes among the negroes, as is evidenced by the increase of negro physicians and surgeons from 909 in 1890, to 3,409 in 1910, while the dentists have grown from 120 to 478 during the same period of time. This growth in professional service may be largely attributable to the developments in education. The number of colored teachers and professors in colleges has grown from 15,100 in 1890 to 29,772 in 1910, while the respective ratio in 1910 was one negro teacher to every 333 of the population as compared with one white teacher to every 144 of the white population.

The standards of education, however, cannot be determined on a numerical basis, but there is much more to be learned from the percentage of school attendance of negroes, which increased for negroes between the age of five and twenty years, from 31 per cent. in 1900 to 44.7 per cent. in 1910, though this is in sharp contrast with the corresponding figures for whites of the same age, 53.6 per cent. in 1900, and 63.1 per cent. in 1910. This marked increase in school attendance on the part of the negroes tends to raise the individual educational standards and goes far to making possible the attainment in education of sufficient fundamental material to facilitate professional training.

Illiteracy has markedly decreased among negroes, falling from 571 per thousand population of ten years of age and over in 1890 to 304 in 1910. As is properly stated in the excellent volume on the Negro Population recently issued by the *Bureau of the Census*, "The persons who were 15 to 24 years of age in 1890, for example, so far as they were still living at succeeding censuses, were 25 to 34 years of age in 1900 and 35 to 44 in 1910. The percentage illiterate for this group of individuals

decreased from 45.7 in 1890 to 39.3 in 1900, and to 32.3 in 1910." The general illiteracy among negroes ten years of age and over has fallen from 57.1 per cent. in 1890 to 30.4 per cent. in 1910. When this is compared with the illiteracy percentages of the whites, native born 3 per cent. and foreign born white 12.7 per cent. in 1910, one recognizes the great need for giving more attention to the educational opportunities for negroes.

The vast growth of the professional classes among the negroes is of pronounced importance in working out the health problems of this imposing group of our national population. Leaving aside the large proportion of negroes in the dispensary population, it must be patent that there is at present an inadequate supply of negro physicians to meet the legitimate demand of this part of the population, for which few special efforts have been made along the line of organized medical aid. To lighten the burdens from sickness and accident, it is essential that every effort be made to develop a larger proportion of trained physicians from among the negroes in those sections of the country where their percentage in the population is large. The fundamental machinery involves the educational system. A policy which suppresses the development of any large group of the community is contrary to public policy and opposed to the interests of the country as a whole.

War has undoubtedly changed in large part the mental attitude of many thousands of negroes who responded to the call for national service, and are in turn seeking justice at the hands of their country. Democracy is most attainable through education; and equality of educational opportunity is at its very foundation. Medical institutions might well take cognizance of their duties and obligations in this emergency. Hospitals, dispensaries, and public health agencies employing physicians should give particular attention to the part they must play in granting justice and freedom of education to the negro whose ambition spurs him to take up a professional life. The importance of the changing educational standards from the elementary school system through normal schools and colleges is only an indication of the alterations which must develop in the higher institutions of learning among which medical colleges must be classed. Whether there be segregation or not, the responsibility for providing a capable teaching staff, of affording ample opportunity for hospital experience, followed up by a supervised clinical experience, remains.

Medicine recognizes, or should recognize, no color line. Surgery certainly is no different insofar as technic is concerned, despite the moderate variations in the frequency of pathological conditions among the whites and the negroes. If the negro physician and surgeon is not given an opportunity to attain his potential development the mass of negroes will receive inadequate medical attention and public health progress will be unnecessarily retarded.

Progress in Surgery

A Résumé of Recent Literature.

The Value of Solid Paraffin Wax in Facial Surgery. SPENCER MORT, Glasgow. *The Lancet,* July 19, 1919.

Mort, after using all kinds of materials in facial surgery, has come to the conclusion that solid wax is the best material to use as a permanent subcutaneous splint. Melted wax usually gives great trouble; it often solidifies in the needle; it cannot be introduced smoothly, because it comes out of the syringe in spurts and then solidifies in lumps. Mort uses cold wax, pure hard paraffin with a melting point of 110° to 115° F.

The wax is broken off into small pieces, then shaped into little splints about ¼ x ¼ x ½ inch. These are introduced under scars or wherever desired through a small incision, which is then closed over.

Ankylosis of the Jaw Due to Fixation of the Temporal Muscle: Method of Treatment. GORDON B. NEW, Rochester, Minn. *Journal of the American Medical Association,* July 26, 1919.

The types of jaw ankylosis are three, according to New; the articular, involving only the bony joint, is the most common and is comparatively easy to relieve, the results of operation being uniformly good. It consists of an arthroplasty of the temporomaxillary joint through a curved incision, two inches long, from above the zygoma and down in front of the ear, and the removal of at least one-half of the condyle and the ascending ramus of the jaw. It is not necessary to interpose any tissue in the new joint, and, if this is normal, the operation is not difficult. If the typical deformity of ankylosis began early in life, the joint will be very low, and should be attacked from above, by removing the lower margin of the zygoma, thus avoiding the facial nerve. Treatment of the extra-articular form, and that in which both muscles and joint are involved, is much more difficult and presents many problems. New reports a recent case of extra-articular ankylosis relieved by an operation, which, as far as he knows, is original. The cause of the ankylosis was an operation several years before on the Gasserian ganglion, which was successful so far as the neuralgia was concerned, but left the joint with ankylosis by fixation of the temporal muscle. Stretching failed to help; so the following operation was performed: "A mastoid retractor was inserted and the zygoma exposed well forward. In elevating the soft tissues over the zygoma, it is essential to keep close to the bone, thus preventing injury to the facial nerve. By means of blunt dissecting scissors and a periosteal elevator the inner surface of the zygoma was freed so a piece of it one inch long was removed with a Gigli saw. This piece was placed in a warm wet gauze sponge. The temporal muscle and coronoid process were then exposed and removed with a curved chisel and bone-biting forceps. The attachment of the temporal muscle to the inner surface and notch of the ascending ramus was removed by blunt dissecting scissors. The temporomaxillary joint was exposed but not opened, and was found to be normal." The piece of the zygoma was replaced and secured by catgut and dermal sutures. Next day the patient could open his mouth and, in a week, separate his jaws an

inch and was able to chew. The function has now been restored for four months.

Thoracic Fistula and Chronic Empyema. HOWARD LILIENTHAL, New York. *Annals of Surgery*, July, 1919.

Lilienthal describes in detail his method of exposure of the chest cavity, and operations for chronic empyemas and sinuses. He has followed this procedure in war wounds of the chest cavity, with excellent results. The main advantages of his operation are the excellent exposure of the thoracic cavity, allowing thorough inspection of the thorax, and the fact that it leaves a linear scar, in contrast to the deforming conditions present after chest-collapsing operations like the Schede, Estlander, Wileus or Delorme operations.

The anesthesia is preferably intra-pharyngeal, especially in recent cases; with foot-bellows or pump attachment to regulate the intra-pulmonary pressure. The incision is a long linear one in the sixth or seventh space, close to the upper border of the rib, and exposure of the cavity is secured by means of powerful rib retractors. When the lung is found retracted and fixed, covered by a dense membrane, the membrane should be incised vertically, and dissected off bluntly as far as possible. Intra-pulmonary pressure is now applied by the anesthetist and the extent of mobilization of the lung determined. Superficial tears of the surface of the lung should not cause any alarm. As a rule, adhesions between the chest wall and the lung should not be disturbed. The wound is closed in layers with tube drainage. After-treatment should consist in cautious irrigations of Dakin's solution, when it is certain that no bronchial fistula is present.

Cases suitable for this type of operations are:

1. Cavities and sinuses persisting for more than two months.
2. Those with large rigid cavities and profuse discharge.
3. Cases with small cavities which have resisted other forms of treatment.

The Treatment of Chest Injuries. MARION A. BLANKENHORN, Cleveland. *Journal of the American Medical Association*, July 26, 1919.

The treatment of chest injuries at the beginning of the great war was very unsatisfactory but was much improved toward the end, both in technic and scope. Methods of examination of a wounded chest are precise; the damage can be estimated, and the treatment indicated. Foreign bodies usually follow a definite course, and, if lodged, can be located by the roentgen ray. With proper appliances, the trained surgeon can invade the thorax to remove infection and make repairs. The effect of infecting organisms is still the greatest unknown quantity. His paper is based on the experience of various British and American surgeons in handling approximately 500 cases. The chest wounds in the forward area hospitals fall into five main groups, according to their severity and the urgency of treatment: (1) open pneumothorax; (2) extensive parietal wounds, involving ribs and muscles; (3) large, retained foreign bodies; (4) infected hemothorax, and, (5) simple hemothorax. There is no spontaneous cure for open pneumothorax or the sucking wound. Immediate anatomic repair is indicated and affords almost instant relief. If untreated, the patient rapidly failed, and died, apparently from asphyxia. Simple stopping of the wound with a plug of gauze would revive a man in a few hours, sufficiently to enable him to undergo an extensive operation and exposure of his wound. Parietal wounds, penetrating or not, demand the same consideration as other wounds, with the additional reason that infection may be induced by the broken bones, or that these may injure the heart and pericardium. Parietal wounds of less extent are a continuous source of infection to an adjacent hemothorax. If they connect with the pleural space by ever so small a sinus, they cannot be drained. It was found advisable to convert a parietal wound into an open pneumothorax if necessary to make a thorough revision and good closure. Opening the chest freely was found easy and safe; the procedure was well tolerated and caused very little shock. A good nitrous oxid machine and a skilled anesthetist are necessary. Retained foreign bodies are dangerous as a source of infection and mechanical erosion of large vessels. Undeformed bullets and shrapnel balls are strikingly harmless, but shell fragments are usually wrapt around with clothing and dirt, and, if they are as large as an inch in diameter, are almost never tolerated. They must be removed as soon as possible to prevent abscess or empyema. If large, the man is usually unfit for immediate operation on account of hemorrhage, shock or both; and if the first persists in spite of treatment, he will probably never be fit for operation. Transfusion or infusion only increased the hemothorax, and the patient died suddenly with angina. The pressure and volume of fluid in the chest apparently crowded the lung and heart out of action. Rest in a warm bed with plenty of fluids and morphin, however, usually brought the patients to a fit condition for the operation required for the removal of the foreign body. Frequently, the rib resection should be made sufficient to admit the hand to the thoracic cavity in order to explore it fully. The fourth and fifth ribs in the axillary space are best for this purpose. If the foreign body was removed through healthy pleura, it had to be sutured, if through carnified lung, hemostasis or closure was not usually needed. How much should be done for carnified lung was a question, and Blankenhorn thinks that beyond removing gross contamination and necrotic tissue, the less done the better. The tolerance of the operation by the patients was remarked on. It was thought by many that the lung should be kept collapsed and at rest after the injury, but the removal of collections of air or fluid from the pleural cavity introduced a new problem. Infection of the pleural sinus was the greatest foe to the man who survived his anatomic injury, but it was surprising how the pleural membranes combated infection when in their natural position and condition, and hence the accumulations of air or fluid should be prevented as far as possible. After the operation and the closure, serous exudates appeared, and, sometimes, repeated aspiration was needed. In other cases, the fluid kept accumulating and finally became purulent, causing a small empyema at the base of the chest, but drainage was easy. The infected and the uninfected hemothorax were at first confused and managed alike. The degree of contamination and amount of free fluid are the principal determining factors—each case must be managed by itself. Many patients, in cases in which there was no infection, did well without interference, but in infected cases, as a rule, free drainage was needed. If it could be delayed by repeated tapping, the results were generally good. Some cases require drainage at once. In cases with drainage, the management was much the same as in civil surgery, except in some instances in which empyema cavities were treated by the Carrel-Dakin method with good results.

A Case of Perforated Gastric Ulcer, with Abscess Formation; Perforation through the Lung, with Spontaneous Recovery. JULIUS FRIEDENWALD, Baltimore. *American Journal of Medical Sciences*, August, 1919.

The patient was aged 51 years and had a history of gastric ulcer dating back twenty-five years. After some weeks of exaggerated symptoms, he was suddenly seized with severe agonizing pains over the left upper abdomen; the abdomen was distended and the epigastric area was tender. The following day, pain was present in the left hypochondrium; this persisted for ten days, accompanied by temperature ranging between 101 and 103 degrees. He developed a cough and hiccoughing, which were followed shortly by a purulent expectoration. He expectorated during the first day about a quart of pus. When the expectoration began, the temperature receded, and the pain became greatly diminished. After admission to the hospital, he continued to expectorate pus in decreasing amounts, and finally went on to complete recovery. Roentgenography showed a defect at the pyloroduodenal junction, revealing an ulcer at this area. The patient had a gastric ulcer, which perforated. This was followed by the formation of a sub-phrenic abscess, and

finally a perforation through the lung, with expectoration of pus.

Roentgen Examination of the Abdominal Organs Following Oxygen inflation of the Peritoneal Cavity. ARTHUR STEIN and WILLIAM H. STEWART, New York. *Annals of Surgery,* July, 1919.

The authors review the history of oxygen-inflation of the peritoneal cavity, preparatory to *x*-ray examination, and present their own simplified technic. Three to four liters of oxygen are introduced. The apparatus is an ordinary gas bag as used with the Bennet inhaler, connected by a tube to the introducing needle. The point of selection is about two to three finger breadths to the left of the umbilicus and about one and a half inches below it. The patient lies on his back. The needle is pushed through till it touches the fascia. After a short stop, it is pushed further through the fascia, muscle and peritoneum without any difficulty. Slight pressure on the bag will now inflate the abdominal cavity. Three to four liters are injected. The procedure is apparently perfectly safe and no ill-effects have been encountered.

The pictures are taken two to three hours after inflation. *X*-ray pictures taken in this manner show beautifully the parenchymatous organs, liver, spleen, kidney and diaphragm. Their clarity is astonishing. The authors present several beautiful demonstrations. Pathological conditions such as carcinomatosis, cirrhosis of the liver, enlargement of the spleen, and tumors of the stomach, intestines and ovaries are easily demonstrated. The authors were also able to demonstrate the normal uterus with its round ligaments, small cystic ovaries, normal bladder, normal gall-bladder, normal spleen with its outstanding pedicles, and both kidneys. They believe this to be a method of great diagnostic value.

The authors make no mention of the danger of puncturing adherent intestine, if such adhesion happen to present at the site of puncture.

Abdominal Surgery Under Local Anesthesia. ROBERT E. FARR, Minneapolis. *Journal of the American Medical Association,* August 9, 1919.

Farr advocates local anesthesia in abdominal surgery. Its advantages are, first, its greater safety and, second, the better management for the avoidance of hemorrhage made possible by the use of epinephrin, and the possibility of doing more deliberate work. The dangers from sepsis probably differ very slightly in the two methods, but the opportunity for giving more attention to detail and the undisturbed condition of the viscera probably give local anesthesia some technical advantage. The struggles of the patient and the danger of rupturing an abscess, thus spreading infection, difficulties present under general anesthesia, are better avoided, as well as some post-operative conditions, such as vomiting. One of the greatest advances of surgical technic of the last two decades has been the realization that the tissues should be as little traumatized as possible, and to local anesthesia and to those who have employed it must go much of the credit for this advance. With local anesthesia, resulting in a negative intra-abdominal pressure, and the viscera retracting instead of extruding from the abdominal wound, better opportunities for inspection are afforded in many ordinary operations. It is true the viscera may not be displaced and handled as readily, distant digital exploratory operations may be more difficult, and adherent masses are not so easily dealth with. In the proper class of cases for local anesthesia, however, visual examination has advantages equal to those of digital exploration. The element of time, which has been the basis of an objection, Farr thinks, needs little consideration. Other things being equal, the more deliberately an operation can be performed, the better. With the less amount of hemorrhage and trauma in the local method, shock is less liable to occur, and the subsequent condition of the patient is consequently better. The absence of thirst, nausea and vomiting, and the low percentage of gas pains, which occur proportionately to the amount of handling of the viscera, are other factors. The percentage of abdominal operations that can be successfully performed under local anesthesia will depend largely on the experience of the operator. In Farr's experience, abdominal operations can be performed on children under local anesthesia with even greater facility than under general anesthesia.

As regards technic, the agent of choice is procain, 0.5 per cent., in Ringer's solution, combined with epinephrin, five drops to the ounce. Excepting in hernia cases, he prefers direct infiltration of the abdominal wall rather than conduction anesthesia. All layers are infiltrated before the incision is made, and if supplementary injection is needed, he considers it an indication of faulty technic. Minute attention is given to details, and equable distribution of the injections. "The ideal aimed at is to deposit the fluid equably throughout the desired area without any sensation of pain on the part of the patient after the first needle prick, which is made for the production of the initial intradermal wheal. All subsequent wheals are made from beneath. . . ., and the intradermal wheal is repeated only for the purpose of secondary introductions of the infiltrating needle as the field is traversed. Aside from the wheal points, the skin is anesthetized by a subdermal infiltration. A 4-inch Record needle, No. 23, is used. Through this a wall of infiltration is built beneath the proposed line of incision, with a base from a 2 to 3 inches in width, the apex being the line of incision through the skin." Five years ago he discarded the syringe, and now uses the pneumatic injector for this work. With this, the ordinary abdominal wall can be anesthetized in from two to three minutes, and the incision made at once. A number of special points in operating on different organs and under different conditions are noticed, and Farr makes the positive statement that all plastic surgery on the abdominal wall, with or without adhesions falls readily in the ideal class for local anesthesia. It should no longer be confined to minor surgery, and to the cases in which the patient cannot, apparently, take a general anesthetic. With proper equipment and technic, a large proportion of major surgery can be performed under this method, with greater safety, less trauma, and less post-operative discomfort, than when general anesthesia is employed; and the operation can be performed more completely.

Disappointments after Gastro-Enterostomy. SIR BERKELY MOYNIHAN, Leeds. *The British Medical Journal,* July 12, 1919.

While the operation of gastro-enterostomy is one of the most successful procedures in surgery, the numerous disappointments following it leads Moynihan to study the causes of failure. He tabulates the failures in the following manner:

A. The operation has been performed in the absence of any organic lesion justifying it.

There are two types of such cases: first, the functional disorders of the stomach, not associated with organic lesions, and secondly, cases of mistaken diagnosis, in which there was chronic disease elsewhere. Moynihan has seen gastro-enterostomy performed for the following conditions: chronic appendicitis, tuberculosis of the intestine, cholelithiasis, cirrhosis of the liver with gastric hemorrhages, splenic anemia, tabes dorsalis (gastric crisis), multiple sclerosis, toxemia of pregnancy, lead poisoning, prolapse of kidney, colonic adhesions, epigastric hernia.

B. The operation has been incomplete. Many cases of gastric and duodenal ulcers, have gastro-enterostomy performed, while the ulcer itself is left untreated. The local disease should be removed as far as possible, or infolded, and associated conditions like chronic appendicitis and cholelithiosis attended to.

C. There were defects in technique of the operation. These are as follows:

1. A long jejunal loop has been left, instead of a short one.
2. The efferent loop has become adherent.
3. The jejunun has been rotated around its long axis and twisted.
4. The opening is too small.
5. The opening is badly placed. The opening should

always reach the greater curvature; preferably in direct line with the esophagus.
6. The rent in the mesocolon has not been closed. This may cause internal hernia.
7. Unabsorbable sutures have been used. These often cause late hemorrhages.
8. There was an imperfect closure of the abdominal wall.

D. Late complications may develop after an operation, performed in a case requiring it, without any technical flaw. These are jejunal ulcer, carcinomatous change in a gastric ulcer.

The main symptoms after unsuccessful gastro-enterostomy are pain, vomiting, hemorrhage, diarrhea.

Pain may be due to revival of activity in an unhealed ulcer, the presence of a jejunal ulcer, adhesions, the presence of another disease which has been overlooked.

Hemorrhage may be due to the separation of a suture, continued activity in an ulcer, a jejunal ulcer, the presence of some other disease as splenic anemia, cirrhosis of the liver, etc.

Vomiting may be due to obstruction due to any of the technical defects of the operation, and to functional causes. Diarrhea may be due to too rapid emptying of the stomach, some other pathological condition of the intestine, the offensive character of the escaping stomach contents.

Trendelenburg Anesthesia in Surgery of the Pelvis. DONALD GUTHRIE, Sayre, Pa. *Journal of the American Medical Association,* August 9, 1919.

Guthrie advocates the Trendelenburg position in anesthesia to avoid injury of the small intestine, and to avoid ileus and shock. It may be asked why the anesthesia administration may not be begun in the dorsal position, and the patient changed after she begns to come under its influence. He has tried this but finds it less satisfactory. The patient does not yield to suggestions and is likely to begin straining and coughing, which are fatal to the success of the method, if the position is changed. To wait until she is fully anesthetized does not give the diaphragm time to pull the small intestine out of the pelvis. He describes the method as follows: "The anesthetist, who has previously met the patient, accompanies her to the operating room, feeding her mind with well chosen suggestions. The patient steps on a stool and sits on the table, the foot part of which has been lowered. The legs are fastened to the foot of the table by a broad surcingle which is fitted snugly, but not made uncomfortably tight. . . . The patient then lies down on the table with her hands clasped and her arms folded across her chest. The arms are fastened by a gauze bandage, which is attached to the head of the table. The table is now lowered in the high Trendelenburg position and the anesthesia begun. . . . Absolute quiet is maintained in the operating room while the anesthetic is given. The patient's attention is left entirely with the anesthetist." Comparing this method with the one usually employed, he says it is amazing to see the difference in the gauze packing necessary to be used to obtain exposure. The article is illustrated.

Uterine Hemorrhage. ARNOLD STURMDORF, New York. *New York Medical Journal,* July 19, 1919.

In this article, Sturmdorf calls attention to a type of hemorrhage called "functional metrorrhagia which is characterized by a flow of incoagulable blood from the uterus. This condition must be differentiated from those in which blood clots are expelled. The latter are nearly always due to surgical lesions, while the former are all amenable to cure by local and systemic medication.

The identity of this condition is based upon conclusions reached by the author in his studies on uterine hemorrhage. These conclusions are as follows:

1. The general circulating blood, during the menstrual period and in the hemorrhagic conditions here considered, shows normal coagulative properties.
2. During menstruation and such hemorrhage, the endometrium receives the normally coagulable blood from the general circulation and gives vent to this blood in a noncoagulable state.
3. The noncoagulability of the menstrual and hemorrhagic blood discloses an identity in experimental and clinical manifestations, differing only in degree.
4. Under the given conditions the endometrium exercises a function capable of rendering coagulable blood noncoagulable.
5. This function, normal to menstruation, is due to an inhibiting substance, generated in the endometrium. The secretion of this substance is activated by a hormone periodically liberated from the Graafian follicle of the ovary.
6. The noncoagulable blood contains all the essentials to coagulation, nevertheless, this blood does not coagulate and is capable of inhibiting coagulation in normal blood from any source, all of which warrant the assumption that the inhibitive biochemical element, presenting coagulation under normal conditions during menstruation, becoming augmented or protracted by contributory disturbances, presents the direct local causative factor in the production of uterine hemorrhage.

The treatment consists of local intrauterine applications of acetone or 16 per cent. liquor formaldehyde. The cure is effected gradually. In obstinate cases *x*-ray or radium may be tried.

The Distribution of Adenomyomata Containing Uterine Mucosa. THOMAS M. CULLEN, Baltimore. *American Journal of Obstetrics,* August, 1919.

Cullen reports a series of tumors of various portions of the body, containing uterine mucosa. These adenomyomata consist of a matrix of non-striped muscle and fibrous tissue. Scattered throughout this matrix are isolated groups of glands, sometimes lying in direct contact with the muscle, but usually lying in a characteristic stroma. The glands resemble in every particular, those found in the mucosa lining the body of the uterus. The author describes such adenomyomata occurring in the urterus, round ligaments, utero-ovarian ligaments, utero-sacral ligaments, recto-vaginal septum, and umbilicus Occasionally he has found large quantities of uterine mucosa in the normal ovary.

Corpus Luteum Extract in Vomiting of Pregnancy, with Report of Cases. JAMES KNIGHT QUIGLEY, Rochester, N. Y. *American Journal of Obstetrics,* August, 1919.

Quigley presents the summary of cases treated by this method:

Number of cases treated, 17.
Number of cases benefited permanently, 12.
Number of cases benefited but relapsing, 4 (not enough given).
Number of cases of complete failure, 1.
One case of pruritus, no relief.

Average number of doses, 7; had the four relapsing cases been given more at the onset as a routine there would probably have been more cases permanently benefited.

Preparation used, a 1-cc. ampoule containing 0.2 gm. desiccated substance of the gland.

Episeotomy: Its Relation to the Conduct of Labor. CHARLES G. CHILD, JR., New York. *Medical Record,* July 26, 1919.

Child urges the wider application of this operation which seems to be falling into disuse. He advises inspection of the vaginal walls, between labor pains as the head recedes from the vulva, and believes that superficial tears of the mucous membrane are indicative of deeper tears to come. These cases are proper subjects for episeotomy.

The operation of episeotomy consists in enlarging the outlet of the birth canal by an incision made with a knife, or preferably with scissors. The site of the incision is on one side of the vulva, and should go through the skin, subcutaneous and adipose tissue, down to the levator muscle. The division of the muscle should be carried to a point just sufficient to allow the birth of the head. The extent necessary is gauged as the head advances with each pain. The division of the fibers pro-

gresses hand in hand with the pressure of the head, until the proper point has been reached. In some primiparæ, in whom the introitus is over-small, or the head over-large, bilateral episeotomy may be necessary. In breech extractions, where plenty of room is so often necessary for the release of extended arms, or to incise a cervix that has contracted around the neck of the after-coming head, no chances should be taken with a small incision.

The suturing of the incision after delivery offers no particular difficulty. Interrupted silkworm-gut sutures are the best, and these should be passed deeply from without inwards, taking up all tissue as far as the vaginal mucosa. This latter is then united by a continuous suture of No. 2 chromic catgut. All sutures can be introduced while waiting for the expulsion of the placenta when the patient is still under the anesthetic, and their introduction is greatly facilitated by the placing of a medium sized laparotomy pad in the vagina to prevent the obstruction of the field of operation by the blood coming from the uterus. These sutures ought not be tied, however, until after the delivery of the placenta in case it should be adherent, making a manual removal necessary.

The Radical Cure of Pelvic Deformity. HENRY JELLET, Dublin. *Surgery, Gynecology and Obstetrics,* August, 1919.

In a rather emphatic discussion of pubiotomy, Jellet makes a decided plea for the revival of this operation, not merely for terminating a difficult labor, but in order to permanently cure the condition of contracted pelvis. The author presents the statistics of thirty-five cases. He mentions five principles which he attempts to establish in his paper. These are:

1. Pubiotomy is not merely a method of terminating a difficult labor, it is rather a means of effecting a radical cure of pelvic contraction.
2. Pubiotomy is indicated in both first and second degrees of contracted pelvis.
3. Pubiotomy is not an alternative to Cesarian section any more than is the wiring of a fractured bone an alternative to amputation of the limb.
4. Pubiotomy should never be postponed willingly to the end of the second stage, but should ideally be carried out independently of pregnancy, when its effects are likely to be required.
5. Every effort should be made to prevent union of the bony surfaces. This can be prevented by refraining from the prolonged use of the pubiotomy belt, by allowing patients early movement, and by getting them out of bed as soon as possible.

Pregnancy and Labor Following Amputation of the Cervix Uteri. O. S. PAULIK, Chicago. *Surgery, Gynecology and Obstetrics,* August, 1919.

The author reviews the literature to date, from the gynecological and obstetrical standpoint. In women who are approaching the climacteric, there is no question as to the value of the procedure. But there are many objections to the performance of this operation during the child-bearing period. Abortion occurs in about 50 per cent. of cases, and nearly all the others that become pregnant have dystocia. Fortunately, sterility is not uncommon following this operation and the author believes that sterility should be assured when performing it.

Operative Cure of Inguinal Hernia. FRANZ TOREK, New York. *Annals of Surgery,* July, 1919.

Torek reports a modified hernia operation, which he has performed in about six hundred cases, with one-third of one per cent. recurrences. The main features of his operation are based upon the anatomical discovery that a hernial sac protrudes itself in between the spermatic vessels lying above and the vas lying below, at the borders of the internal ring. He believes that the smooth angle formed by the junction of vas and spermatic vessels at the internal ring, invites the formation of hernias and recurrences after operation. The essential point then, in which his operation differs from others is that the vas and vessels are carefully separated and freed of connective tissue and fat, and the vas allowed to come out at a point below where the vessels come out. In other words, some of the Bossini sutures must intervene between the spermatic vessels and the vas.

The salient points in his technic are:

1. Clean separation of the vas deferens and the blood-vessels from each other as well as from the sac, by the removal of all the connective tissue that binds them together, allowing the vas to come out at the bottom of the opening in the transversalis fascia, and the vessels to come out at the top of it, while the stump of the sac sinks back between the two. A couple of stitches uniting the muscles to Poupart's ligament, keep the vas and vessels permanently separated at the site of the internal ring.
2. Below the vas, suturing of Poupart's ligament to the internal oblique and often to the rectus muscle is continued all the way down to the insertion at the pubis. This is of importance to avoid recurrence in the shape of a direct hernia, as well as for the repair of the one already existing.
3. The employment of non-absorbable suture at those parts where there is tension, the preference being silver wire.
4. A number of minor points, classed under the head of common sense rules. For instance, the approximation of Poupart's ligament and muscles must be absolutely clean, without the interposition of any structure such as fat, connective tissue or cremaster muscle; alignment must be accurate; the sutures must be sufficiently close to allow no gaping of tissues between them; they must not be drawn so tight as to cut into or through the tissues; when there is much tension, the sutures must be laid closer to each other, than in the absence of tension.

Stricture and Calculus of the Ureter from the Diagnostic Viewpoint. GUY L. HUNNER, Baltimore. *Southern Medical Journal,* July, 1919.

Ureteral stricture is one of the commonest causes of abdominal symptoms in women. Unrecognized ureteral stricture leads to more needless and fruitless abdominal operations than any other pathologic condition. These operations in the probable order of frequency are for appendicitis, ovarian disease, uterine and pelvic disorders, floating kidney, especially the type with hydronephrosis, gall-bladder investigations, and abdominal explorations for intestinal obstruction and adhesions.

Ureteral stricture is the cause of more kidney pathology (excluding conditions usually classified as medical) than any one factor. It accounts for the majority of hydronephrosis cases, and thus indirectly for many cases of floating or movable kidney and of pyonephrosis. The majority of pyelitis cases have ureteral stricture and obstruction as a basis. Most cases of pyelitis of pregnancy and of puerperium depend upon stricture, as do many cases of pyelitis in children. Some cases of albuminuria and eclampsia leading to premature childbirth are due to stricture. Most cases of stone in the ureter and probably many cases of stone found in the kidney and bladder arise in an area of ureteral stricture.

In differentiating stone from stricture, one must take into account the anamnesis, physical examination urinalysis, *x*-ray and cystoscopic findings, and, as a last resort, the ureteral catheter. The history offers no differential points between stricture and stone, but it must be remembered that stricture may follow the passage of a stone. In cases of stone or stricture the kidney may be large or tender, and there may be tenderness along the course of the ureter. Occasionally a point of tenderness may be elicited through the vagina. Urinalysis does not help in differentiating stone and stricture. The *x*-ray will show stones, if present, but there may be an associated or independent stricture in addition to the stone. Cystoscopy alone does not help in the differential diagnosis.

The last resort in diagnosis is the wax-tipped ureteral catheter, which takes an impression of a stone, or meets the obstruction due to stricture. Finally, *x*-ray pictures

may be taken with the catheter *in situ*. But even with all these means at our command, errors in diagnosis are frequent.

The Results of Splenectomy in the Anemias. Wm. J. Mayo, Rochester, Minn. *Annals of Surgery*, July, 1919.

Mayo reports the results of splenectomy in three types of anemias, splenic anemia, pernicious anemia, and hemolytic icterus.

Under splenic anemia, are included the cases of Banti's disease, which the author believes (according to E. Moschcowitz), is simply a late manifestation of splenic anemia. Sixty-one patients were operated upon, of which seven died. The deaths all occurred in advanced severe cases. Many of these cases were cured, even in the later stage. (Exact figures and data are not given.)

Pernicious anemia as a rule is not benefited by splenectomy. There seems to be no logical basis for this procedure. The author reports 50 cases, with three deaths. The cases which showed most decided improvement, were not proven cases. Many cases show marked but only temporary palliation of symptoms. Wherever pernicious anemia has developed to the stage where the blood-picture is characteristic, it is incurable, and splenectomy is only a means of palliation.

Twenty-seven cases of hemolytic icterus were splenectomized with uniformly satisfactory results. "The triumph of splenectomy is the cure of hemolytic icterus."

The No-Flap or Guillotine Amputation: An Unfortunate Resurrection. John H. Gibbon, Philadelphia. *Annals of Surgery*, July, 1919.

On account of the danger of secondary hemorrhage, the painful dressings, long periods of convalescence, and extensive secondary operations, which follow guillotine amputations, Gibbon believes that this operation, as performed in the theater of war was unjustified in most cases. The extra time required to dissect up skin flaps, is so little, and the results obtained so much better, that circular amputation should be reserved for only the most extreme cases. After a flap operation, the stump can be sterilized and the flaps brought down in a very short time, thus avoiding all the disagreeable features of the no-flap operation.

Cranioplasty: The Value of a Graft of Bone, Cartilage or Fascia in the Closure of Cranial Defects Caused by Wounds in War. Alexander Primrose, Toronto. *Annals of Surgery*, July, 1919.

Primrose reports the results of forty-two cases of cranioplasty by various forms of graft for the relief of symptoms caused by cranial defects. All of these defects were due to various forms of war injuries. The time elapsing between the original injury and the secondary operation varied from 9-50 months. The symptoms were either subjective when the lesion was in a "silent" area, or there were evidences of organic lesion as hemiplegia, aphasia, sensory disturbances, headaches, etc.

Headache was present in all the cases except four, and these all had wounds of the motor area and suffered from hemiplegia. Headache was relieved in all but ten cases. Relief of dizziness was more certain than that of headache. Loss of memory, present in seven cases, was improved in some after a lapse of several months. Deafness present in four cases was not improved. No result was obtained when loss of vision or aphasia was present.

There were fifteen cases of hemiplegia. While many of these cases were showing gradual improvement at the time the gap was closed, it cannot be said that the operation had any effect on recovery from the condition. Jacksonian epilepsy, present in seven cases, was relieved in several, but it cannot be said that a permanent cure was effected.

Cases with the sense of fear, and feeling of insecurity associated with gaps of the cranium are decidedly benefited by the operation.

The technic of the operation is described in detail. Grafts used were either cartilage, fascia, bone, bone button, or bone from the cadaver. There was no mortality, and post-operative infection occurred in only five cases. Five cases failed to secure firm closure of the gap.

The author believes that where a gap exists in the cranium it should be relieved. The symptoms caused by the existence of the gap and not due to organic lesion, will almost certainly be relieved by a successful cranioplasty.

Malaria from the Surgeon's Standpoint. Marguerite White, Malta. *The Lancet*, July 26, 1919.

White reports several unusual cases, operated upon for apparently surgical diseases, in whom no surgical lesion was found and which were later proved to be malarial in origin. She reports also a case of acute hemorrhagic pancreatitis due to the malarial parasite. As a result of several years of study at Malta, with the Royal Army Medical Corps, she presents the following opinions.

1. An operation may often bring on an attack of malaria of a very severe nature, and an acute dilatation of the heart during or following an operation is very frequent, often proving fatal. Ether is the safest anesthetic in malarial patients; chloroform is absolutely contraindicated.

2. The parasites of sub-tertian malaria may attack any organ, giving all the symptoms of clinical disease of that organ.

3. The negative history of malaria, and the absence of parasites in the blood are of no account in the diagnosis of a positive malaria.

4. In a malarial patient, convulsions and coma may occur in an apparently healthy man without any warning, and it is not uncommon for a man with acute cerebral malaria to be arrested for drunkenness. In every case of brain or spinal cord disease or other obscure complaints in men who have been East, malaria is one of the first things the surgeon should consider.

5. Sub-tertian malaria may simulate almost any disease, surgical, mental, or medical. It may produce such insidious symptoms, that when the patient feels ill enough to see a doctor, treatment is of no avail.

6. In the acute attacks, there may or may not be a chill, and parasites may or may not be found in the blood.

Book Reviews

Collected Papers of the Mayo Clinic, Rochester, Minn. Edited by Mrs. M. H. Mellish. *Volume X*, 1918. Octavo; 1196 pages; 442 illustrations. Philadelphia and London: W. B. Saunders Company, 1919.

This, the tenth volume of Mayo Clinic papers (the twelfth including the two volumes of early papers by Wm. and Charles Mayo), is arranged regionally in the same fashion as its predecessors and, like them, admirably edited by Mrs. Mellish. Although called the 1918 papers, it contains many that appeared in 1919. The total number of articles is 96, making a book larger than the 1917 volume by about 200 pages.

The Operations of Obstetrics. Embracing the Surgical Procedures and Management of the More Serious Complications. By Frederick Elmer Leavitt, Formerly Assistant Professor of Obstetrics and Gynecology, University of Minnesota; Obstetrician to the City and County Hospital; the St. Paul Hospital, the Bethdesa Hospital, etc., St. Paul, Minnesota. Octavo; 466 pages; 248 illustrations. St. Louis: C. V. Mosby Co., 1919.

The book presents a rather convenient, handy reference for the busy practitioner who does operative obstetrics. There is hardly anything in it which may not be found in one of the standard books on obstetrics as for example in De Lee's or Williams, but for those who

prefer to find description and illustration of operative obstetrics in compact and consecutive form it will serve a useful purpose.

The Anatomy of the Peripheral Nerves. A. MELVILLE PATTERSON, M.D., F.R.C.S., Lieut.-Colonel R.A.M.C. Assistant Inspector of Special Military Surgical Hospitals, Professor of Anatomy in the University of Liverpool, Examiner in Anatomy at the Royal College of Surgeons of England, etc. Small octavo; 165 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS, 1919.

This book aims to provide a brief account of the development, morphology and distribution of the cerebræ, spinal and sympathetic nerves to supply the need felt by surgeons who are dealing with war wounds. In a paragraph on "The Regeneration of Nerves," the writer maintains that after clean severance of nerves, immediate suture may be followed within a month by restoration of function; also that new, growing axons may be found in the distal stump of a divided nerve. The sketchy embryological material is introduced in an interesting way and throws light upon subsequent anatomical development. The language used is confused in many places by tautology and bad focusing.

Books Received

A Stereoscopic Atlas of Plastic Surgery of the Face, Head and Neck. With Case Reports. By JOSEPH C. BECK, M.D., F.A.C.S., and IRA FRANK, M.D., F.A.C.S., Chicago, Ill. St. Louis: C. V. MOSBY CO., 1919.

Roentgen Interpretation. A Manual for Students and Practitioners. By GEORGE W. HOLMES, M.D., Roentgenologist to the Massachusetts General Hospital and Instructor in Roentgenology, Harvard Medical College, and HOWARD E. RUGGLES, M.D., Roentgenologist to the University of California, Hospital and Clinical Professor of Roentgenology, University of California Medical School. Small octavo; 211 pages; 181 illustrations. Philadelphia: LEA & FEBIGER, 1919.

The Principles of Nursing. By CHARLOTTE A. BROWN, R.N., Superintendent of Nurses, New England Hospital for Women and Children; Graduate of Boston City Hospital and Boston Lying-in Hospital Training School for Nurses; Late Instructor of Nurses in the Hartford Hospital Training School for Nurses. Small octavo; 262 pages; illustrated. Philadelphia and New York: LEA & FEBIGER, 1919.

Industrial Nursing. For Industrial, Public Health, Pupil Nurses, and for Employers of Labor. By FLORENCE SWIFT WRIGHT, R.N.; Bureau of Child Hygiene, New Jersey State Department of Health; Formerly Secretary of the Benefit Association of the Employees of John Wanamaker, New York; and formerly in charge of Industrial Nursing for both the Cheney Brothers' Silk Mills and the Clark Thread Company. Duodecimo; 179 pages. New York: THE MACMILLAN COMPANY, 1919.

The Nervous Heart. Its Nature, Causation, Prognosis and Treatment. By R. M. WILSON, Capt., R.A.M.C., late Assistant to Sir James McKenzie, under the Medical Research Committee; Cardiologist to the Trench Fever Research; author of *The Hearts of Men;* and JOHN H. CARROLL, Major, M.C., U.S.A., specially attached Trench Fever Committee; Assistant Visiting Physician, City Hospital, New York; Instructor, Clinical Medicine, University and Bellevue Hospital Medical College. Duodecimo; 136 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS, 1919.

A Text Book of Urology in Men, Women and Children, Including Urinary and Sexual Infections, Urethroscopy and Cystoscopy. By VICTOR COX PEDERSEN, A.M. M.D., F.A.C.S., Major, Medical Corps, U. S. Army; Visiting Urologist to St. Mark's Hospital; Member, American Urological Association. Large octavo; 991 pages; 362 engravings and 13 colored plates. Philadelphia and New York: LEA & FEBIGER, 1919.

The Pituitary. A Study of the Morphology, Physiology, Pathology, and Surgical Treatment of the Pituitary, together with an Account of the Therapeutical Uses of the Extracts Made from This Organ. By W. BLAIR BELL. Octavo; 348 pages; illustrated. New York: WILLIAM WOOD & COMPANY, 1919.

Cerebrospinal Fluid in Health and in Disease. By ABRAHAM LEVINSON, B.S., M.D., Associate in Pediatrics, Northwestern University Medical School; Associate Pediatrician, Sarah Morris Children's Hospital of the Michael Reese Hospital, Chicago; Attending Pediatrican, Mount Sinai Hospital, Chicago; Attending Physician, Children's Department Chicago-Winfield Tuberculosis Sanitarium. With a Foreword by LUDVIG HEKTOEN, M.D. Small octavo; 230 pages; 56 illustrations, including 5 color plates. St. Louis: C. V. MOSBY COMPANY, 1919.

War Neuroses and Shell Shock. By FREDERICK W. MOTT, M.D., LL.D., F.R.S., F.R.C.P., Brevet Lt.-Col., R.A.M.C. (T); Senior Neurologist to the Maudsley Neurological Clearing Hospital; Consulting Physician, Charing Cross Hospital; Director, Pathological Laboratory, L.L.C. Asylums; Corresponding Member, Neurological and Psychiatrical Societies, Paris. With preface by THE RT. HON. CHRISTOPHER ADDISON, M.P.; Minister of Reconstruction. Small octavo; 348 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS. 1919.

Psychoses of the War, Including Neurasthenia and Shell Shock. By H. C. MARR, Lieut.-Col., R.A.M.C. (Temp.), M.D.; F.R.F.P.S., Glasgow; Neurological Consultant to the Scottish Command; formerly Specialist in Nervous Diseases to the troops in Malta (1915-16); Physician Superintendent of Glasgow District Mental Hospital, etc. Small octavo; 330 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS. 1919.

The Medical and Surgical Aspects of Aviation. By H. GRAEME ANDERSON, M.B., Ch.B., F.R.C.S., Surgeon-Lieut., Royal Navy; Surgeon, Royal Air Force, Central Hospital; Senior Assistant Surgeon, St. Mark's Hospital; Senior Assistant Surgeon, Belgrave Hospital. With Chapters on *Applied Physiology of Aviation,* by MARTIN FLACK, M.A., M.B., Lieut.-Col., R.A.F., Director of Medical Research to the Royal Air Force, and *The Aero-Neuroses of War Pilots,* by OLIVER H. GOTCH, M.B., Ch.B., M.R.C.P. (London), and an Introduction by THE RT. HON. THE LORD WEIR OF EASTWOOD, P.C.; Secretary of State for the Royal Air Force. Small octavo; 255 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS, 1919.

Trench Fever. A Louse-borne Disease. By MAJOR W. BYAM, R.A.M.C.; Captains J. H. CHURCHILL, R.A.M.C. (T), LYN DIMOND, R.A.M.C., V. E. SORAPURE, R.A.M.C., R. M. WILSON, R.A.M.C., and L. L. LLOYD, R.A.M.C. (T), entomologist. With an Introduction by LIEUT.-GENERAL SIR T. H. GOODWIN, K.C.B., Director-General, Army Medical Services. A foreword by MAJOR-GENERAL SIR DAVID BRUCE, K.C.B., F.R.S., A.M.S., and a summary of the report of the American Trench Fever Commission by LIEUT. R. H. VERCOE, R.A.M.C. Small octavo; 330 pages; illustrated. London: HENRY FROWDE, HODDER & STOUGHTON. OXFORD UNIVERSITY PRESS, 1919.